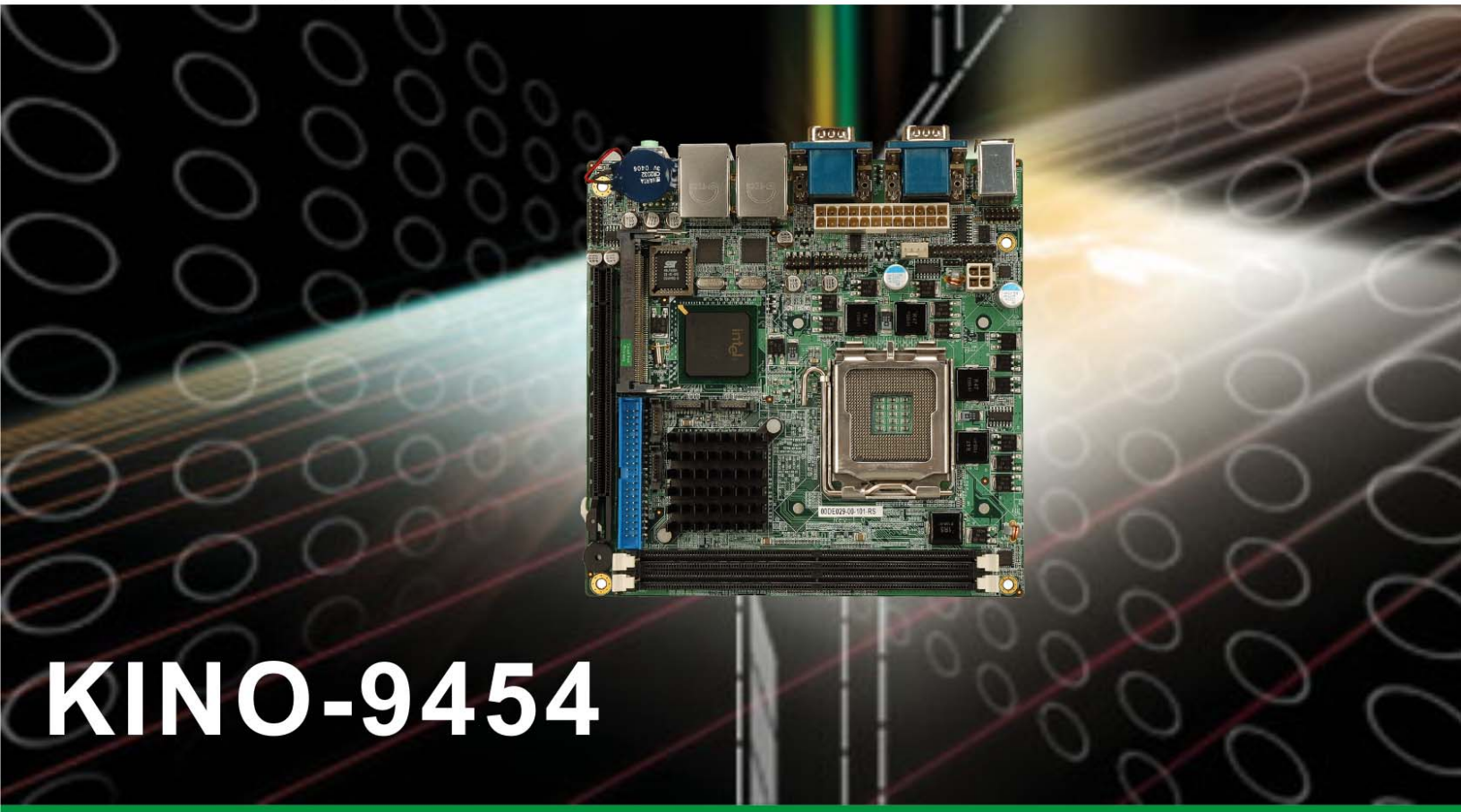
IEI Technology Corp.



# KINO-9454

## Mini-ITX Motherboard with Intel® Pentium 4 / Pentium D 1066/800/533MHz CPU Dual PCI-E GbE, SATA II, USB 2.0 and Audio

# User Manual

Rev. 1.0 September, 2006

RoHS Lead Free

## REVISION HISTORY

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|---|---|---|
| **Revision Number** | **Description** | **Date of Issue** |
| **1.0** | **Initial release** | **September 2006** |
| | | |

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# Glossary

| | |
|---|---|
| AC '97 | Audio Codec 97 |
| ACPI | Advanced Configuration and Power Interface |
| APM | Advanced Power Management |
| ARMD | ATAPI Removable Media Device |
| ASKIR | Shift Keyed Infrared |
| ATA | Advanced Technology Attachments |
| BIOS | Basic Input/Output System |
| CFII | Compact Flash Type 2 |
| CMOS | Complementary Metal Oxide Semiconductor |
| CPU | Central Processing Unit |
| Codec | Compressor/Decompressor |
| COM | Serial Port |
| DAC | Digital to Analog Converter |
| DDR | Double Data Rate |
| DIMM | Dual Inline Memory Module |
| DIO | Digital Input/Output |
| DMA | Direct Memory Access |
| EIDE | Enhanced IDE |
| EIST | Enhanced Intel SpeedStep Technology |
| FDD | Floppy Disk Drive |
| FDC | Floppy Disk Connector |
| FFIO | Flexible File Input/Output |
| FIFO | First In/First Out |
| FSB | Front Side Bus |
| IrDA | Infrared Data Association |
| HDD | Hard Disk Drive |
| IDE | Integrated Data Electronics |
| I/O | Input/Output |
| ICH4 | I/O Controller Hub 4 |
| L1 Cache | Level 1 Cache |
| L2 Cache | Level 2 Cache |
| LCD | Liquid Crystal Display |
| LPT | Parallel Port Connector |
| LVDS | Low Voltage Differential Signaling |
| MAC | Media Access Controller |
| OS | Operating System |
| PCI | Peripheral Connect Interface |
| PIO | Programmed Input Output |
| PnP | Plug and Play |
| POST | Power On Self Test |
| RAM | Random Access Memory |
| SATA | Serial ATA |
| S.M.A.R.T | Self Monitoring Analysis and Reporting Technology |
| SPD | Serial Presence Detect |
| S/PDI | Sony/Philips Digital Interface |
| SDRAM | Synchronous Dynamic Random Access Memory |
| SIR | Serial Infrared |
| UART | Universal Asynchronous Receiver-transmitter |
| USB | Universal Serial Bus |
| VGA | Video Graphics Adapter |

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Chapter

1

# Introduction

## 1.1 KINO-9454 Overview

The Mini-ITX form factor KINO-9454 with Pentium 4 / Pentium D / Celeron D CPU platform is fully equipped with latest technology and advanced multi-mode I/Os. The KINO-9454 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

### 1.1.1 KINO-9454 Applications

The KINO-9454 is designed for applications in the following areas:

- Industrial and hard environment PC applications
- Human Machine Interface (HMI) applications
- Communication and network monitoring applications
- Marine, GPS and transportation applications
- Financial, retail and kiosk applications
- Medical applications

### 1.1.2 KINO-9454 Benefits

Some of the KINO-9454 benefits include:

- Dual-core Intel® processor support
- DDR2 memory technology support
  - Dual-channel DDR2 memory technology at 667MHz
  - Up to 10.7GB/s of peak memory bandwidth
- SATA II with 3.0Gb/s transfer rate
- Dual PCIe GbE enhance high performance in network
- Multiple storage option integration including
  - 40 Pin IFM or 2.5” HDD
  - Four SATA II ports support
- Supports PCI Express x16 high-performance graphic card
  - 8-cm low profile
  - DVI/VGA/HDTV/LVDS output
- Low profile design for embedded chassis

### 1.1.3 KINO-9454 Features

Some of the KINO-9454 features are listed below:

- Complies with RoHS
- Supports Intel® Pentium 4 / Pentium D / Celeron D CPUs
- Supports a maximum front side bus (FSB) speed up to 1066MHz
- Supports up to 2GB of 400MHz, 533MHz or 667MHz of DDR2 memory
- Comes with two high performance gigabit Ethernet (GbE) controller
- Supports four SATA channels with transfer rates up to 3.0Gb/s
- Supports eight USB 2.0 devices

## 1.2 KINO-9454 Board Overview

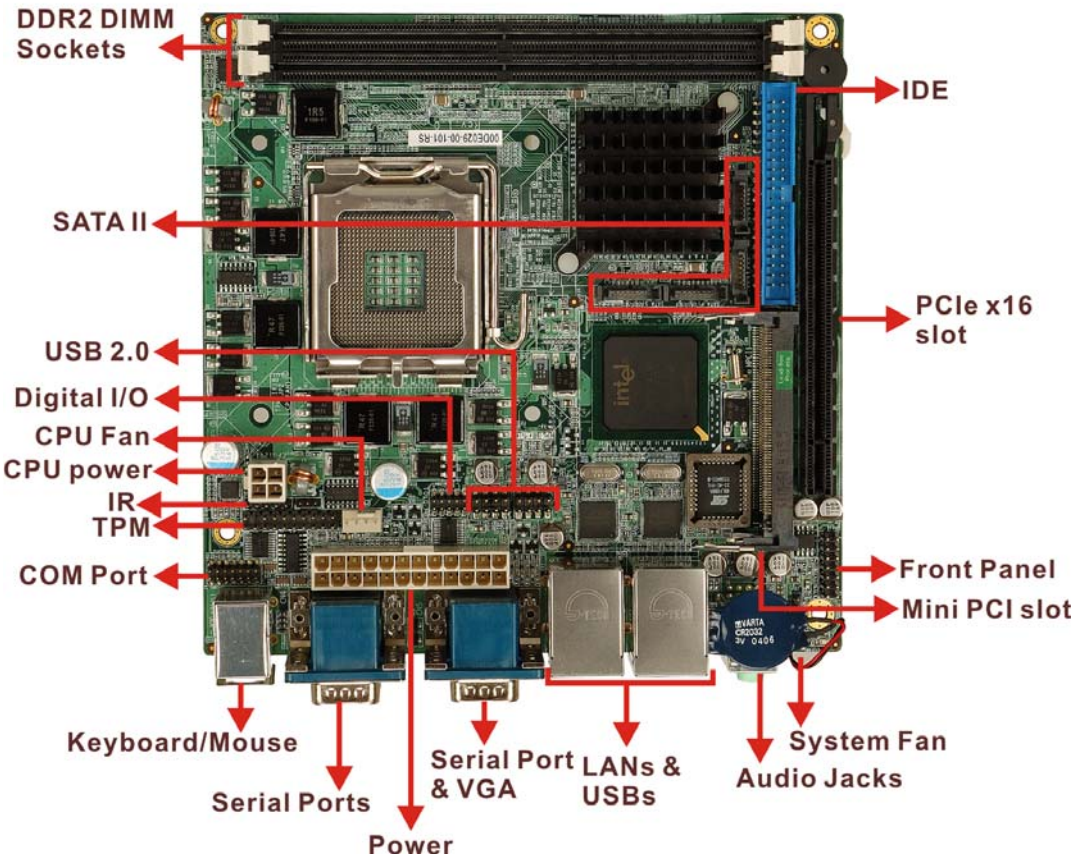


**Figure 1-1: KINO-9454 Board Overview**

### 1.2.1 KINO-9454 Connectors

The KINO-9454 has the following connectors on-board:

- 1 x CPU 12V power connector
- 2 x DDR2 DIMM sockets
- 2 x Fan connectors
- 1 x Front panel connector
- 1 x Digital Input/Output connector
- 1 x IDE Interface connector
- 1 x IR interface connector
- 1 x Mini PCI slot
- 1 x PCI Express x16 slot
- 1 x Power connector
- 1 x Serial port connector
- 4 x SATA II connectors
- 1 x TPM connector
- 2 x USB connectors

The KINO-9454 has the following connectors on the board rear panel:

- 2 x Audio jacks
- 1 x CRT connector
- 2 x Ethernet connectors
- 2 x Keyboard/Mouse connectors
- 3 x Serial port connectors
- 4 x USB 2.0 ports

The KINO-9454 has the following on-board jumpers:

- Clear CMOS
- COM2 mode selection (RS-232/422/485)

The location of these connectors on the motherboard can be seen in **Figure 1-1**. These connectors are fully described in **Chapter 3**.

### 1.2.2 Technical Specifications

KINO-9454 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2 Detailed Specifications**.

| SPECIFICATION | |
|---|---|
| **CPUs Supported** | Intel® Pentium® 4 / Pentium® D / Celeron® D<br>FSB 533/800/1066MHz |
| **Chipset** | Intel 945G Express Chipset:<br>-Intel® 82945G Graphics and Memory Controller Hub (GMCH)<br>-Intel® ICH7 I/O Controller Hub (ICH) |
| **I/O Controller** | ICH7 |
| **Graphics Support** | Intel Graphics Media Accelerator 950 |
| **Display** | CRT |
| **Memory** | Dual channel DDR2 400/533/667MHz memory modules (Max. 2GB) |
| **PCI Bus Interface** | 33MHz, Revision 2.3 |
| **Serial ATA (SATA)** | Four SATA II connectors with 3.0Gb/s transfer rates |
| **HDD Interface** | One IDE channel support two Ultra ATA 100 devices |
| **USB Interfaces** | Eight USB 2.0 connectors supported |
| **Serial Ports** | Four COM ports |
| **Extension** | One PCIe x16 graphic port<br>One Mini PCI slot |
| **Super I/O** | ITE8712 |
| **IrDA** | By super I/O |
| **Digital I/O** | 4 input / 4 output by super I/O |
| **Audio Interfaces** | One Audio Codec ’97 (AC’97) version 2.3 connector |

| | |
|---|---|
| **Ethernet** | Dual Broadcom BCM5787 for PCI Express GbE with ASF2.0 remote control support |
| **BIOS** | AMI BIOS Label |
| **Power** | ATX power |
| **Physical Dimensions** | 170mm x 170mm (width x length) |
| **Operating Temperature** | Minimum: 0ºC (32°F)<br>Maximum: 60°C (140°F) |

**Table 1-1: Technical Specifications**

Chapter

2

# Detailed Specifications

## 2.1 Overview

This chapter describes the specifications and on-board features of the KINO-9454 in detail.

## 2.2 Dimensions

### 2.2.1 Board Dimensions

The dimensions of the board are listed below:

- Length: 170mm
- Width: 170mm

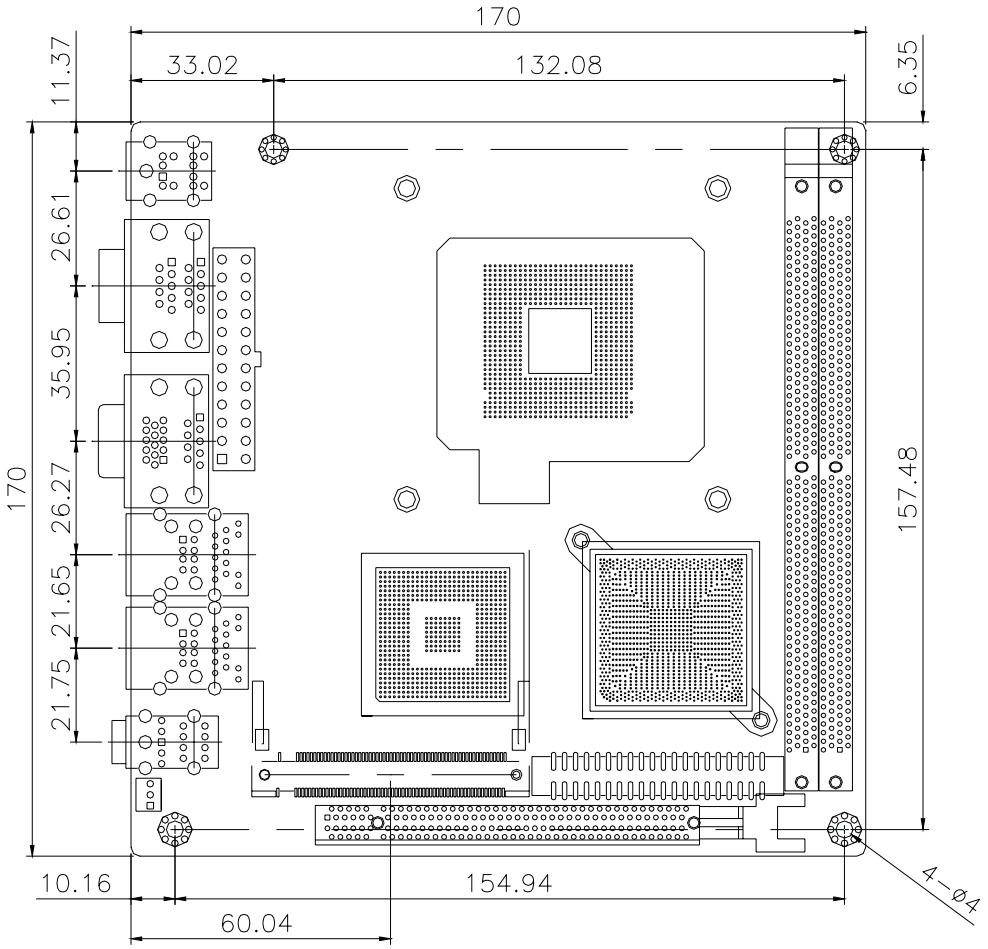


**Figure 2-1: KINO-9454 Dimensions (mm)**

### 2.2.2 External Interface Panel Dimensions

External interface panel dimensions are shown in **Figure 2-2**.

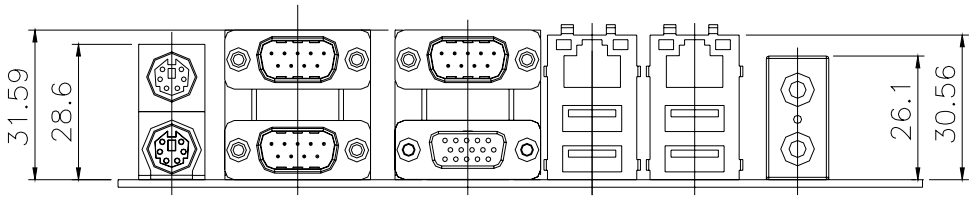


**Figure 2-2: External Interface Panel Dimensions (mm)**

## 2.3 CPU Support

**Table-2-1** lists the CPUs supported by the KINO-9454 board.

| Model | Clock Speed | L2 Cache | Max. FSB | Socket |
|---|---|---|---|---|
| **Intel® Pentium® D** | 2.80 to 3.60 GHz | 1 to 2 MB | 1066 MHz | LGA775 |
| **Intel® Pentium® 4** | 2.66 to 3.80 GHz | 1 to 2 MB | 800 MHz | LGA775 |
| **Intel® Celeron® D** | 2.13 to 3.33 GHz | 256 to 512 KB | 533 MHz | LGA775 |

**Table-2-1: Supported CPUs**

### 2.3.1 Intel® Pentium® D

The Intel® Pentium® D processor comes with the following features:

- The two full processing cores make it easy to handle multiple applications, multimedia entertainment and digital photo editing simultaneously
- Intel® Extended Memory 64 Technology (Intel® EM64T) enables the processor to execute operating systems and applications written to take advantage of the Intel EM64T.
- Intel Speedstep® technology allows tradeoffs to be made between performance and power consumption.
- The Execute Disable Bit feature allows memory to be marked as executable or non-executable.

### 2.3.2 Intel® Pentium® 4

The Intel® Pentium® 4 processor comes with the following features:

- Hyper-threading Technology improves system responsiveness and increases productivity and efficiency.
- Improved Power Management with Enhanced Intel SpeedStep® Technology
- Improved performance by allowing the system to address more than 4 GB of both virtual and physical memory.
- Execute Disable Bit prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system.

### 2.3.3 Intel® Celeron® D

The Intel® Celeron® D processor comes with the following features:

- Intel Extended Memory 64 Technology enhances Intel 32-bit architecture, giving the processor platform access to larger amounts of memory.
- 512KB Level 2 Cache enables improved overall system performance by giving the core faster access to larger amounts of the data used most often.
- Streaming SIMD Extensions Accelerates performance on a wide variety of applications including multimedia, video and audio.
- Minimize the acoustic noise levels generated from running the fan at higher speed for thermal performance.

## 2.4 On-board Chipset

### 2.4.1 Intel® 945G Express Chipset

The Intel® 945G Express Chipset consists of the following chipsets preinstalled on the board:

- Intel® 82945G GMCH
- Intel® ICH7 ICH

The following two sections (**Section 2.4.2** and **Section 2.4.3**) list some of the features of the Intel® 82945G and the Intel® ICH7 chipsets. For more information on these two chipsets please refer to the Intel website.

### 2.4.2 Intel® 82945G Graphics and Memory Controller Hub

The Intel® 82945G GMCH comes with the following features:

- Supports Intel® Viiv™ Technology
- PCI Express x16 interface supports the latest high-performance graphics cards
- PCI Express x1 interface delivers faster access to peripheral devices and networking
- Boosts graphics performance to deliver richer visual color and picture clarity without additional graphics cards
- Integrated audio support enables premium sound and deliver features such as multiple audio streams and jack re-tasking.
- Dual-channel DDR2 memory support

### 2.4.3 Intel® ICH7 I/O Controller Hub

The Intel® ICH7 ICH comes with the following features:

- PCI Express
  - Four PCI Express root ports
  - Supports PCI Express 1.0a
  - Support for full 2.5 Gb/s bandwidth in each direction per x1 lane
- Integrated serial ATA host controller with data transfer rates up to 3.0 Gb/s
- Integrated IDE controller
  - Independent timing of up to two dirves
  - Ultra ATA/100/66/33, BMIDE and PIC modes
  - Tri-state modes to enable swap bay
- Integrated LAN controller
  - Supports IEEE 802.3
  - 10/100 Mb/s Ethernet support
- AC-Link for audio and telephony CODECs
- Intel Matrix Storage Technology
  - Protection against data loss from a hard drive failure
- High-speed SATA II storage interface with 3.0 Gb/s transfer rate
- Power management logic
  - Supports ACPI 3.0

- PCI PME# support

- SMBus
  - Flexible SMBus/SMLink architecture to optimize for ASF
  - Provides independent manageability bus through SMLink interface
  - Support SMBus 2.0 Specification

## 2.5 Graphics Support

The graphics features listed below are all integrated on the Intel 82945G GMCH.

- Built-in support of consumer electronic displays allows native high-definition displays with 720p or 1080i resolutions
- Support for dual-independent display
- Enhance modes for wide screen flat panels and optimized 3D
- Support ADD2 and Media Expansion Cards (MECs)
  - Combine several video output options (DVI, dual independent display, component, composite, HDTV and LVDS) in a single-card solution
  - MECs enable video input capability and PVR functionality
  - Support a wide range of display types and configurations

## 2.6 Memory Support

The KINO-9454 has two DDR2 DIMM sockets and supports two 400MHz, 533MHz or 667MHz DDR2 DIMM with a maximum RAM of up to 2GB.

## 2.7 PCI Bus Interface Support

The PCI bus on the KINO-9454 has the following features:

- 33MHz Revision 2.3 is implemented
- 64-bit addressing on PCI using DAC protocol is supported

## 2.8 GbE Ethernet

The BCM5787 is a seventh generation 10/100/1000BASE-T Ethernet LAN controller solution for high performance network applications. The device combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, PCIe bus interface, and on-chip buffer memory in a single device. The device

is fabricated in a 1.2V CMOS process providing a low-power system solution. The GbE controller features are below.

- Integrated 10/100/1000 transceiver
- 10/100/1000 full/half-duplex MAC
- Automatic MDI crossover function
- Supports PCIe v1.0a
- Wake-on-LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash supported
- JTAG supported
- 196-FBGA package

## 2.9 Drive Interfaces

The KINO-9454 can support the following drive interfaces.

- 4 x SATA drives
- 2 x IDE devices

### 2.9.1 SATA Drives

The KINO-9454 supports four SATA II drives with transfer rates of up to 3.0 Gb/s.

### 2.9.2 IDE Interfaces

The KINO-9454 IDE controller supports up to two IDE devices with the following specifications:

- Supports PIO IDE transfers up to 16MB/s
- Supports Ultra ATA 100 devices with data transfer rates up to 100MB/s

## 2.10 Serial Ports

The KINO-9454 has four high-speed UART serial ports. The serial ports have the following specifications.

- 16C550 UART with 16-byte FIFO buffer

- 115.2Kbps transmission rate

## 2.11 Real Time Clock

256-byte battery backed CMOS SRAM

## 2.12 Infrared Data Association (IrDA) Interface

The KINO-9454 IrDA supports the following interfaces.

- Serial Infrared (SIR)
- Shift Keyed Infrared (ASKIR)

If an IrDA port is need, COM2 must be configured as either SIR or ASKIR mode in the BIOS under **Super IO devices**. Normal RS-232 COM2 is then disabled.

## 2.13 USB Interfaces

The KINO-9454 supports eight USB interfaces, four internal and four external. The USB interfaces support USB 2.0.

## 2.14 BIOS

The KINO-9454 uses a licensed copy of AMI BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-Boot E**x**ecution **E**nvironment ) support
- USB booting support

## 2.15 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the KINO-9454 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks

are also mounted on the chipsets to ensure the operating temperature of these chips remain low.

## 2.16 Audio Codec

The KINO-9454 has an integrated REALTEK ALC655 CODEC. The ALC655 CODEC is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs. Some of the features of the codec are listed below.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
- Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
- 14.318MHz -> 24.576MHz PLL to eliminate crystal
- 12.288MHz BITCLK input
- Integrated PCBEEP generator to save buzzer
- Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V

- Standard 48-pin LQFP package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

## 2.17 Power Consumption

**Table 2-2** shows the power consumption parameters for the KINO-9454 when a Pentium 4 processor with a clock speed of 3.06GHz is running with four DDR2 533MHz 1GB DIMM module.

| Voltage | Current |
|---|---|
| +5V | 1.8A |
| +12V | 5.81A |
| +3.3V | 3.49A |
| 5VSB | 0.37A |

**Table 2-2: Power Consumption**

## 2.18 Packaged Contents and Optional Accessory Items

### 2.18.1 Package Contents

The KINO-9454 is shipped with the following components.

- 1 x KINO-9454 single board computer
- 1 x IDE flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 1 x I/O shielding

- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x Quick Installation Guide

### 2.18.2 Optional Accessory Items

The items shown in the list below are optional accessory items are purchased separately.

- ATI M56P mobile grade PCI Express Graphic Card with VGA, DVI, 1080i HDTV and dual channel 24-bit LVDS interface
- RS-232/422/485 cable
- USB cable
- CPU cooler

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Chapter

3

# Connectors and Jumpers

## 3.1 Peripheral Interface Connectors

**Section 3.1.1** shows peripheral interface connector locations. **Section 3.1.2** lists all the peripheral interface connectors seen in **Section 3.1.1**.

### 3.1.1 KINO-9454 Layout

**Figure 3-1** shows the on-board peripheral connectors, backplane peripheral connectors and on-board jumpers.

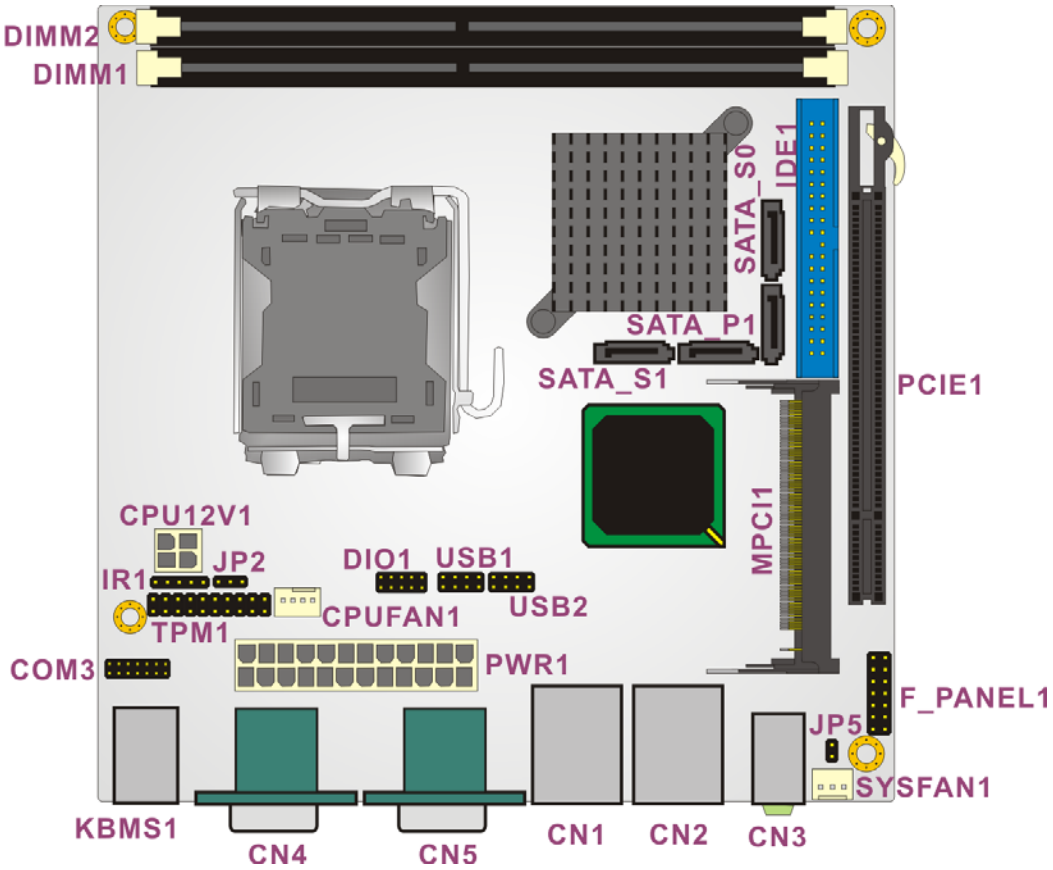


**Figure 3-1: Connector and Jumper Locations**

### 3.1.2 Peripheral Interface Connectors

**Table 3-1** shows a list of the peripheral interface connectors on the KINO-9454. Detailed descriptions of these connectors can be found in **Section 3.2**.

| Connector | Type | Label |
|---|---|---|
| ATX + CPU 12V power connector | 4-pin header | CPU12V1 |
| DDR2 DIMM socket | 240-pin slot | DIMM1 |
| DDR2 DIMM socket | 240-pin slot | DIMM2 |
| Fan connector (CPU) | 4-pin header | CPUFAN1 |
| Fan connector (System) | 3-pin header | SYSFAN1 |
| Front panel connector | 14-pin header | F_PANEL1 |
| Digital Input/Output connector | 10-pin header | DIO1 |
| IDE Interface connector | 40-pin header | IDE1 |
| IR Interface connector | 5-pin header | IR1 |
| Mini PCI connector | 124-pin Mini PCI Type III slot | MPCI1 |
| PCI Express x16 socket | PCI Express x16 slot | PCIE1 |
| Power connector | 24-pin connector | PWR1 |
| Serial port connector | 14-pin header | COM3 |
| SATA drive connector (1) | 7-pin SATA connector | SATA_P0 |
| SATA drive connector (2) | 7-pin SATA connector | SATA_P1 |
| SATA drive connector (3) | 7-pin SATA connector | SATA_S0 |
| SATA drive connector (4) | 7-pin SATA connector | SATA_S1 |
| TPM connector | 20-pin header | TPM1 |
| USB connector (1) | 8-pin header | USB1 |
| USB connector (2) | 8-pin header | USB2 |

**Table 3-1: Peripheral Interface Connectors**

### 3.1.3 Rear Panel Connectors

**Table 3-2** lists the rear panel connectors on the KINO-9454. Detailed descriptions of these connectors can be found in **Section 3.3**.

| Connector | Type | Label |
|---|---|---|
| Audio Jacks | Audio connector | CN3 |
| CRT connector | 15-pin female connector | CN5 |
| Ethernet connector (1) | RJ-45 connector | CN1 |
| Ethernet connector (2) | RJ-45 connector | CN2 |
| Keyboard/Mouse connector | 6-pin mini din connector | KBMS1 |
| Serial port connector (1) | DB-9 male connector | CN4 |
| Serial port connector (2) | DB-9 male connector | CN4 |
| Serial port connector (3) | DB-9 male connector | CN5 |
| USB 2.0 port (1) | USB port connector | CN1 |
| USB 2.0 port (2) | USB port connector | CN2 |

**Table 3-2: Rear Panel Connectors**

### 3.1.4 On-board Jumpers

**Table 3-3** lists the on-board jumpers. Detailed descriptions of these jumpers can be found in **Section 4.6.**

| Description | Label | Type |
|---|---|---|
| Clear CMOS | JP5 | 2-pin header |
| COM2 mode selection | JP2 | 3-pin header |

**Table 3-3: On-board Jumpers**

## 3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-9454.

### 3.2.1 ATX + CPU 12V Power Connector

CN Label: CPU12V1

CN Type: 4-pin headers (1x4)

CN Location: See Figure 3-2

CN Pinouts: See Table 3-4

The connector supports the 12V power supply.

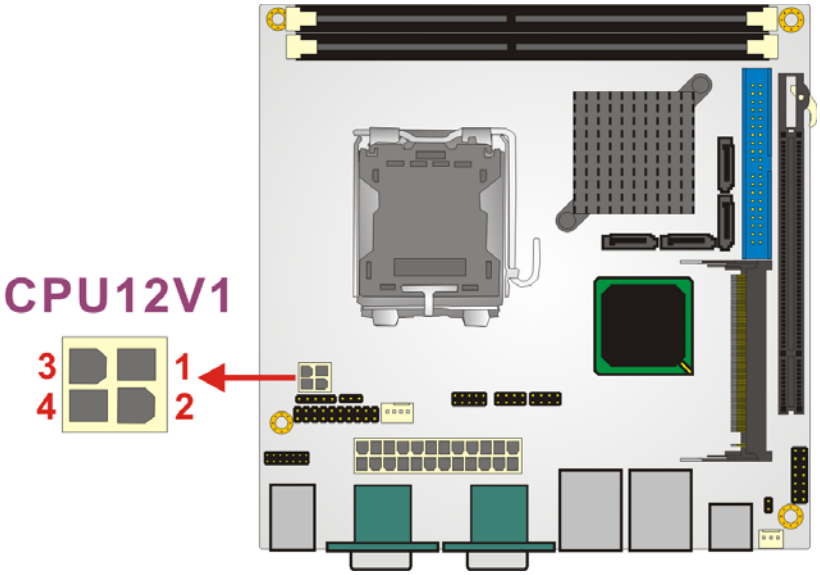


**Figure 3-2: CPU 12V Power Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | +12V | 4 | +12V |

**Table 3-4: CPU 12V Power Connector Pinouts**

### 3.2.2 Fan Connectors

| | |
|---|---|
| CN Label: | CPUFAN1 and SYSFAN1 |
| CN Type: | 4-pin header and 3-pin header |
| CN Location: | See Figure 3-3 |
| CN Pinouts: | See Table 3-5 and Table 3-6 |

The cooling fan connectors on the KINO-9454 provide a 12V, 500mA current to a CPU cooling fan and a system cooling fan. All cooling fans have linear fan speed controlled by BIOS.

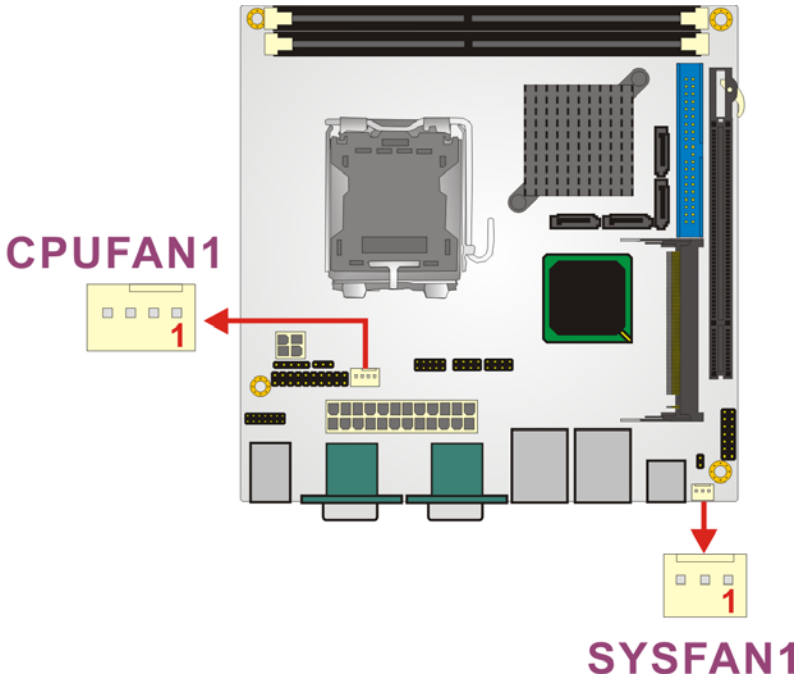


**Figure 3-3: Fan Connector Locations**

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation Signal |
| 4 | Control |

**Table 3-5: CPU Fan Connector Pinouts**

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation Signal |

**Table 3-6: System Fan Connector Pinouts**

### 3.2.3 Front Panel Connector

CN Label: F_PANEL1

CN Type: 14-pin header (2x7)

CN Location: See Figure 3-4

CN Pinouts: See Table 3-7

The front panel connector connects to several external switches and indicators to monitor and control the motherboard. These indicators and switches include:

- Power
- ATX Power button
- Reset button
- Speaker
- HDD

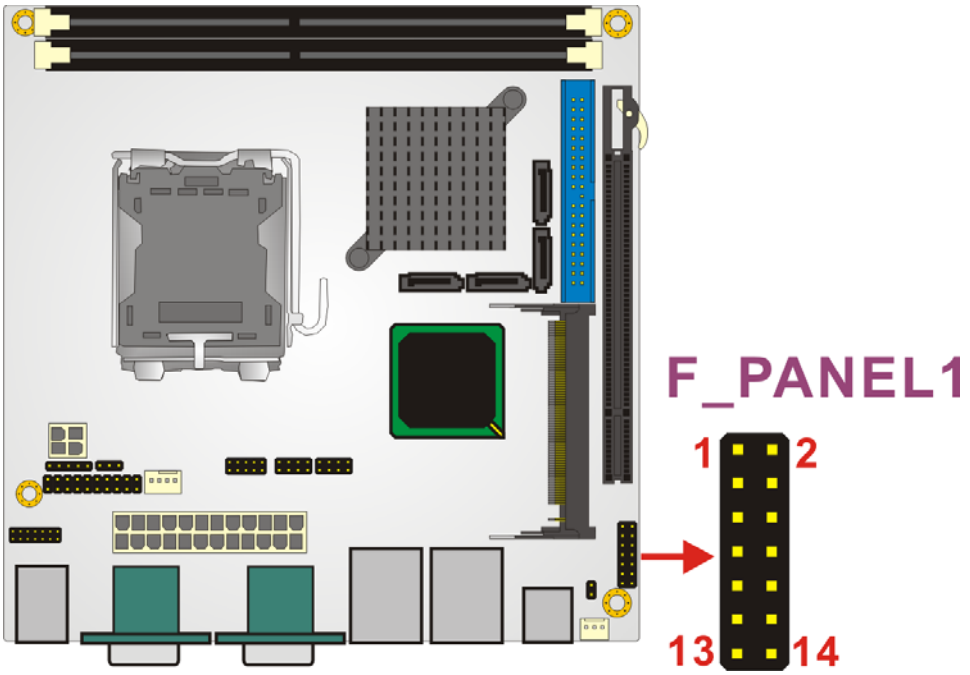


**Figure 3-4: Front Panel Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | LED+ | 2 | BUZZER- |
| 3 | N/C | 4 | N/C |
| 5 | LED- (GND) | 6 | N/C |
| 7 | POWER BUTTON- | 8 | VCC |
| 9 | POWER BUTTON+ | 10 | N/C |
| 11 | IDE_LED+ | 12 | RESET |
| 13 | IDE_LED - | 14 | GND |

**Table 3-7: Front Panel Connector Pinouts**

### 3.2.4 Digital Input/Output Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See Figure 3-5

CN Pinouts: See Table 3-8

The DIO connector is managed through a Super I/O chip. The DIO connector pins are user programmable. The digital IO port of KINO-9454 is 5V CMOS level.

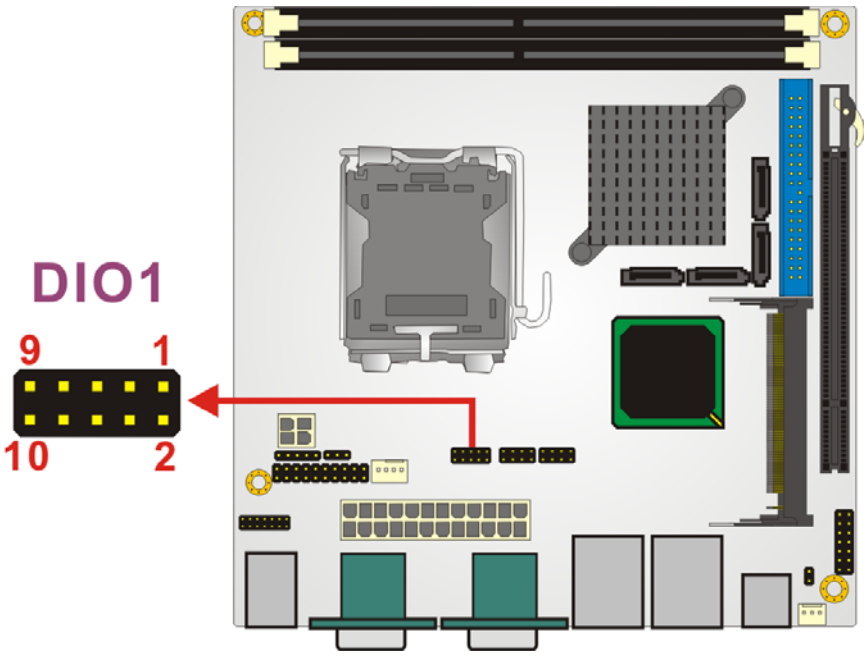


**Figure 3-5: Digital I/O Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GROUND | 2 | VCC |
| 3 | DGPI0 | 4 | DGPO0 |
| 5 | DGPI1 | 6 | DGPO1 |
| 7 | DGPI2 | 8 | DGPO2 |
| 9 | DGPI3 | 10 | DGPO3 |

**Table 3-8: Digital I/O Connector Pinouts**

### 3.2.5 IDE Connector

CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See Figure 3-6

CN Pinouts: See Table 3-9

One primary 40-pin IDE device connector on the KINO-9454 motherboard supports connectivity to ATA 100 IDE devices with data transfer rates up to 100MB/s.

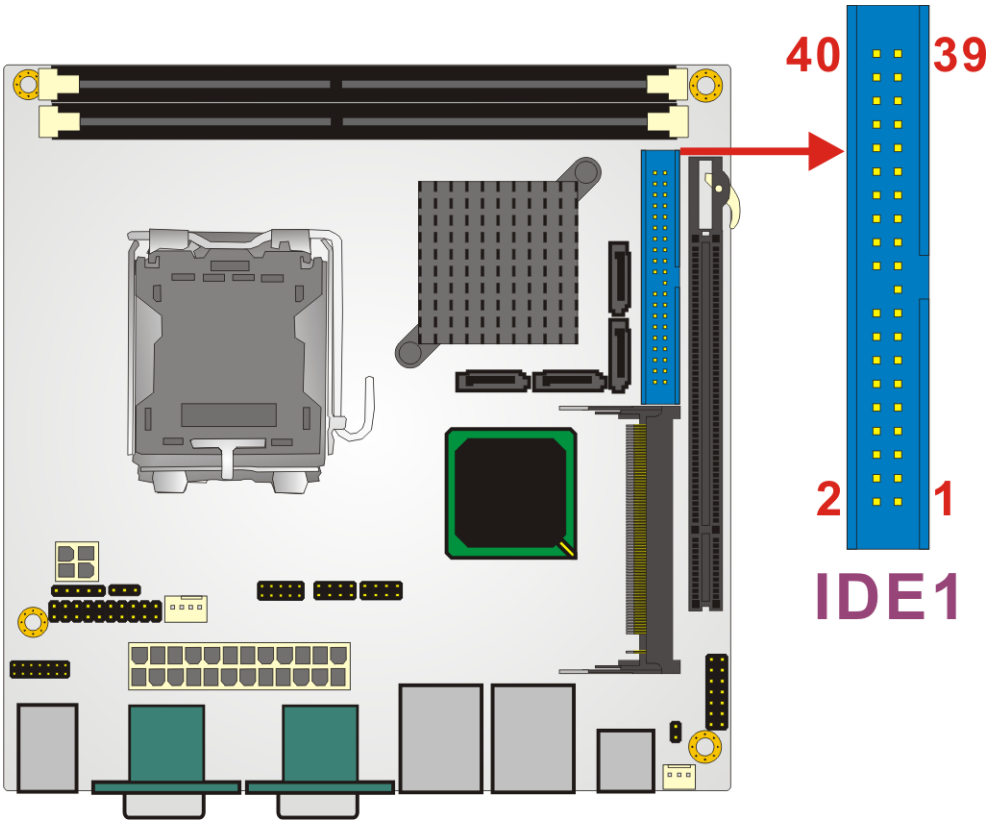


**Figure 3-6: IDE Device Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | RESET# | 2 | GROUND |
| 3 | DATA 7 | 4 | DATA 8 |
| 5 | DATA 6 | 6 | DATA 9 |
| 7 | DATA 5 | 8 | DATA 10 |
| 9 | DATA 4 | 10 | DATA 11 |
| 11 | DATA 3 | 12 | DATA 12 |
| 13 | DATA 2 | 14 | DATA 13 |
| 15 | DATA 1 | 16 | DATA 14 |
| 17 | DATA 0 | 18 | DATA 15 |
| 19 | GROUND | 20 | N/C |
| 21 | DRQ | 22 | GROUND |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 23 | IOW# | 24 | GROUND |
| 25 | IOR# | 26 | GROUND |
| 27 | CHRDY | 28 | REV. PULL LOW |
| 29 | DACK | 30 | GROUND-DEFAULT |
| 31 | INTERRUPT | 32 | N/C |
| 33 | SA1 | 34 | N/C |
| 35 | SA0 | 36 | SA2 |
| 37 | HDC CS0# | 38 | HDC CS1# |
| 39 | HDD ACTIVE# | 40 | GROUND |

**Table 3-9: IDE Connector Pinouts**

### 3.2.6 IR Interface Connector

CN Label: IR1

CN Type: 5-pin header (1x5)

CN Location: See Figure 3-7

CN Pinouts: See Table 3-10

The integrated infrared (IrDA) connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

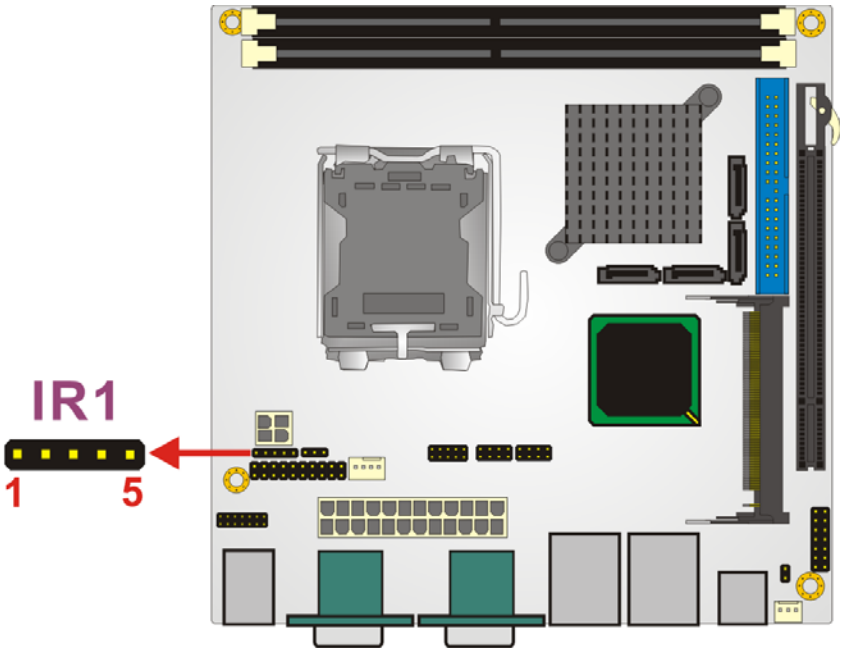


**Figure 3-7: IR Connector Location**

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | VCC |
| 2 | NC |
| 3 | IR-RX |
| 4 | Ground |
| 5 | IR-TX |

**Table 3-10: IR Connector Pinouts**

### 3.2.7 Mini PCI Slot

CN Label: MPCI1

CN Type: 124-pin Mini PCI Type III slot

CN Location: See Figure 3-8

CN Pinouts: See Table 3-11

Mini PCI is a small form factor version of a PCI card. Mini PCI expansion devices can be inserted into the Mini PCI slot.

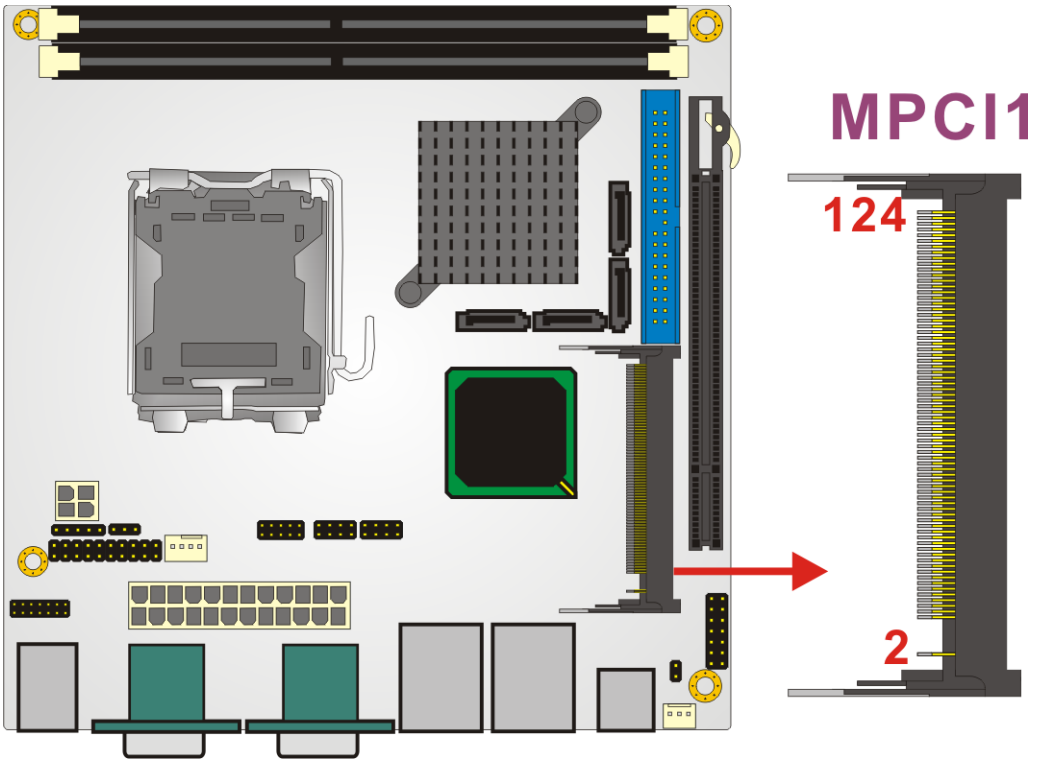


Figure 3-8: Mini PCI Slot Location

| PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME |
|---|---|---|---|---|---|---|---|
| 1 | TIP | 32 | GROUND | 63 | 3.3V | 94 | AD[02] |
| 2 | RING | 33 | AD[31] | 64 | FRAME# | 95 | AD[03] |
| 3 | 8PMJ-3 | 34 | PME# | 65 | CLKRUN# | 96 | AD[00] |
| 4 | 8PMJ-1 | 35 | AD[29] | 66 | TRDY# | 97 | 5V |
| 5 | 8PMJ-6 | 36 | RESERVED | 67 | SERR# | 98 | RESERVED_WIP5 |
| 6 | 8PMJ-2 | 37 | GROUND | 68 | STOP# | 99 | AD[01] |
| 7 | 8PMJ-7 | 38 | AD[30] | 69 | GROUND | 100 | RESERVED_WIP5 |
| 8 | 8PMJ-4 | 39 | AD[27] | 70 | 3.3V | 101 | GROUND |
| 9 | 8PMJ-8 | 40 | 3.3V | 71 | PERR# | 102 | GROUND |
| 10 | 8PMJ-5 | 41 | AD[25] | 72 | DEVSEL# | 103 | AC_SYNC |
| 11 | LED1_GRNP | 42 | AD[28] | 73 | C/BE[1]# | 104 | M66EN |
| 12 | LED2_YELP | 43 | RESERVED | 74 | GROUND | 105 | AC_SDATA_IN |
| 13 | LED1_GRNN | 44 | AD[26] | 75 | AD[14] | 106 | AC_SDATA_OUT |
| 14 | LED2_YELN | 45 | C/BE[3]# | 76 | AD[15] | 107 | AC_BIT_CLK |
| 15 | CHSGND | 46 | AD[24] | 77 | GROUND | 108 | AC_CODEC_ID0# |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | RESERVED | 47 | AD[23] | 78 | AD[13] | 109 | AC_CODEC_ID1# |
| 17 | INTB# | 48 | IDSEL | 79 | AD[12] | 110 | AC_RESET# |
| 18 | 5V | 49 | GROUND | 80 | AD[11] | 111 | MOD_AUDIO_MON |
| 19 | 3.3V | 50 | GROUND | 81 | AD[10] | 112 | RESERVED |
| 20 | INTA# | 51 | AD[21] | 82 | GROUND | 113 | AUDIO_GND |
| 21 | RESERVED | 52 | AD[22] | 83 | GROUND | 114 | GROUND |
| 22 | RESERVED | 53 | AD[19] | 84 | AD[09] | 115 | SYS_AUDIO_OUT |
| 23 | GROUND | 54 | AD[20] | 85 | AD[08] | 116 | SYS_AUDIO_IN |
| 24 | 3.3VAUX | 55 | GROUND | 86 | C/BE[0]# | 117 | SYS_AUDIO_OUT GND |
| 25 | CLK | 56 | PAR | 87 | AD[07] | 118 | SYS_AUDIO_IN GND |
| 26 | RST# | 57 | AD[17] | 88 | 3.3V | 119 | AUDIO_GND |
| 27 | GROUND | 58 | AD[18] | 89 | 3.3V | 120 | AUDIO_GND |
| 28 | 3.3V | 59 | C/BE[2]# | 90 | AD[06] | 121 | RESERVED |
| 29 | REQ# | 60 | AD[16] | 91 | AD[05] | 122 | MPCIACT# |
| 30 | GNT# | 61 | IRDY# | 92 | AD[04] | 123 | VCC5VA |
| 31 | 3.3V | 62 | Ground | 93 | RESERVED | 124 | 3.3VAUX |

**Table 3-11: Mini PCI Slot Pinouts**

### 3.2.8 PCI Express x16 Slot

CN Label: PCIE1

CN Type: 164-pin PCIe x16 slot

CN Location: See Figure 3-9

CN Pinouts: See Table 3-12 (Side A) Table 3-13 (Side B)

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.

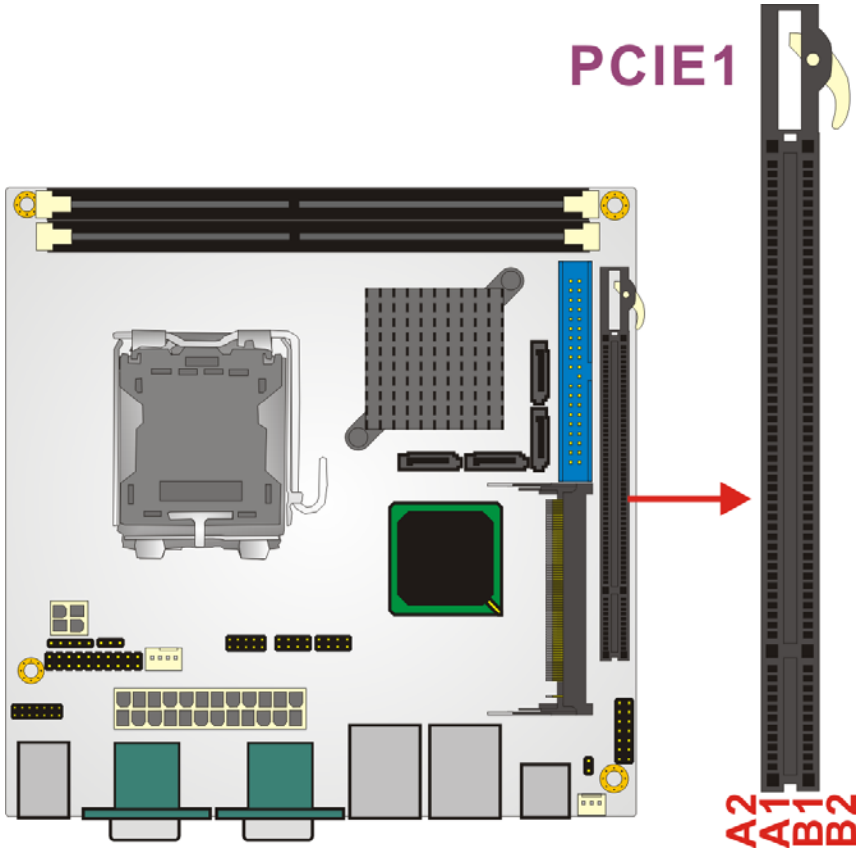


Figure 3-9: PCI Express x16 Slot Location

| PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME |
|---|---|---|---|---|---|---|---|
| A1 | Name | A22 | HSIn(1) | A43 | HSIp(6) | A64 | HSIp(11) |
| A2 | PRSNT#1 | A23 | GND | A44 | HSIn(6) | A65 | HSIn(11) |
| A3 | +12v | A24 | GND | A45 | GND | A66 | GND |
| A4 | +12v | A25 | HSIp(2) | A46 | GND | A67 | GND |
| A5 | GND | A26 | HSIn(2) | A47 | HSIp(7) | A68 | HSIp(12) |
| A6 | JTAG2 | A27 | GND | A48 | HSIn(7) | A69 | HSIn(12) |
| A7 | JTAG3 | A28 | GND | A49 | GND | A70 | GND |
| A8 | JTAG4 | A29 | HSIp(3) | A50 | RSVD | A71 | GND |
| A9 | JTAG5 | A30 | HSIn(3) | A51 | GND | A72 | HSIp(13) |
| A10 | +3.3v | A31 | GND | A52 | HSIp(8) | A73 | HSIn(13) |
| A11 | +3.3v | A32 | RSVD | A53 | HSIn(8) | A74 | GND |
| A12 | PWRGD | A33 | RSVD | A54 | GND | A75 | GND |
| A13 | GND | A34 | GND | A55 | GND | A76 | HSIp(14) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A14 | REFCLK+ | A35 | HSIp(4) | A56 | HSIp(9) | A77 | HSIn(14) |
| A15 | REFCLK- | A36 | HSIn(4) | A57 | HSIn(9) | A78 | GND |
| A16 | GND | A37 | GND | A58 | GND | A79 | GND |
| A17 | HSIp(0) | A38 | GND | A59 | GND | A80 | HSIp(15) |
| A18 | HSIn(0) | A39 | HSIp(5) | A60 | HSIp(10) | A81 | HSIn(15) |
| A19 | GND | A40 | HSIn(5) | A61 | HSIn(10) | A82 | GND |
| A20 | RSVD | A41 | GND | A62 | GND | | |
| A21 | GND | A42 | GND | A63 | GND | | |

Table 3-12: PCIe x16 Side A Pinouts

| PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME |
|---|---|---|---|---|---|---|---|
| B1 | +12v | B22 | GND | B43 | GND | B64 | GND |
| B2 | +12v | B23 | HSOp(2) | B44 | GND | B65 | GND |
| B3 | RSVD | B24 | HSOn(2) | B45 | HSOp(7) | B66 | HSOp(12) |
| B4 | GND | B25 | GND | B46 | HSOn(7) | B67 | HSOn(12) |
| B5 | SMCLK | B26 | GND | B47 | GND | B68 | GND |
| B6 | SMDAT | B27 | HSOp(3) | B48 | PRSNT#2 | B69 | GND |
| B7 | GND | B28 | HSOn(3) | B49 | GND | B70 | HSOp(13) |
| B8 | +3.3v | B29 | GND | B50 | HSOp(8) | B71 | HSOn(13) |
| B9 | JTAG1 | B30 | RSVD | B51 | HSOn(8) | B72 | GND |
| B10 | 3.3Vaux | B31 | PRSNT#2 | B52 | GND | B73 | GND |
| B11 | WAKE# | B32 | GND | B53 | GND | B74 | HSOp(14) |
| B12 | RSVD | B33 | HSOp(4) | B54 | HSOp(9) | B75 | HSOn(14) |
| B13 | GND | B34 | HSOn(4) | B55 | HSOn(9) | B76 | GND |
| B14 | HSOp(0) | B35 | GND | B56 | GND | B77 | GND |
| B15 | HSOn(0) | B36 | GND | B57 | GND | B78 | HSOp(15) |
| B16 | GND | B37 | HSOp(5) | B58 | HSOp(10) | B79 | HSOn(15) |
| B17 | PRSNT#2 | B38 | HSOn(5) | B59 | HSOn(10) | B80 | GND |
| B18 | GND | B39 | GND | B60 | GND | B81 | PRSNT#2 |
| B19 | HSOp(1) | B40 | GND | B61 | GND | B82 | RSVD#2 |
| B20 | HSOn(1) | B41 | HSOp(6) | B62 | HSOp(11) | | |
| B21 | GND | B42 | HSOn(6) | B63 | HSOn(11) | | |

Table 3-13: PCIe x16 Side B Pinouts

### 3.2.9 ATX Power Connector

| | |
|---|---|
| CN Label: | PWR1 |
| CN Type: | 24-pin connector |
| CN Location: | See Figure 3-10 |
| CN Pinouts: | See Table 3-14 |

This 24-pin power connector supports the ATX power supply.

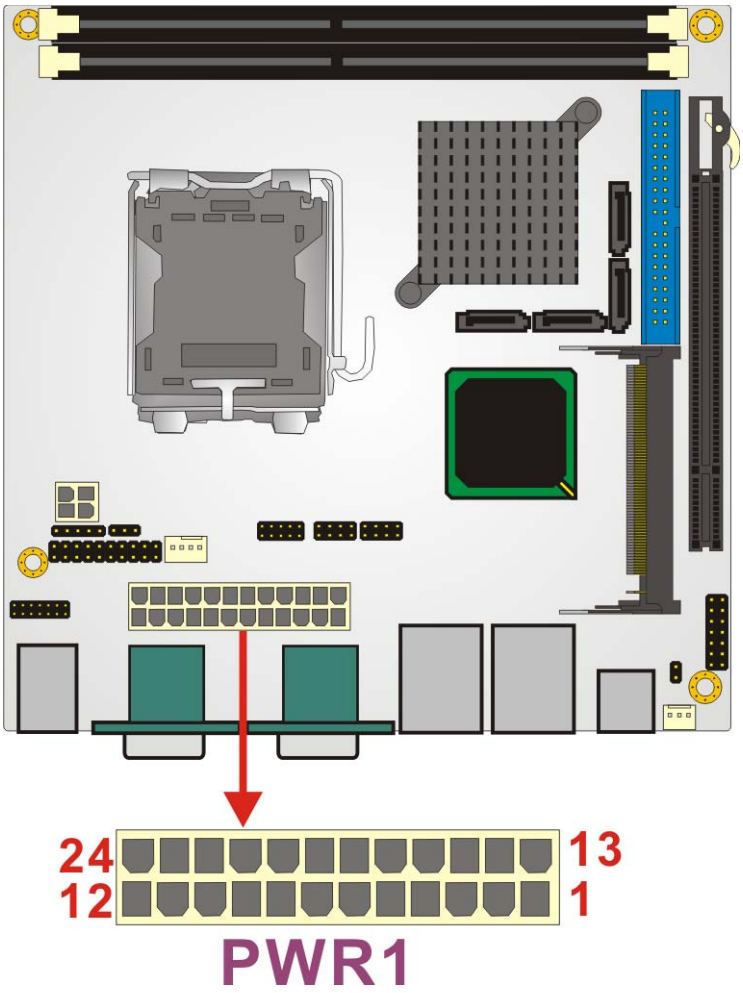


**Figure 3-10: Power Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | +3.3V | 13 | Ground |
| 2 | +3.3V | 14 | PS-ON |
| 3 | Ground | 15 | Ground |
| 4 | +5V | 16 | Ground |
| 5 | Ground | 17 | Ground |
| 6 | 5V | 18 | NC |
| 7 | Ground | 19 | +5V |
| 8 | Power Good | 20 | +5V |
| 9 | +5VSB | 21 | +12V |
| 10 | +12V | 22 | +5V |
| 11 | +3.3V | 23 | +3.3V |
| 12 | -12V | 24 | Ground |

**Table 3-14: Power Connector Pinouts**

### 3.2.10 Serial Port Connector

CN Label: COM3

CN Type: 14-pin header (2x5)

CN Location: See Figure 3-11

CN Pinouts: See Table 3-15

The serial ports connectors connect to RS-232 or RS-422/485 serial port device.

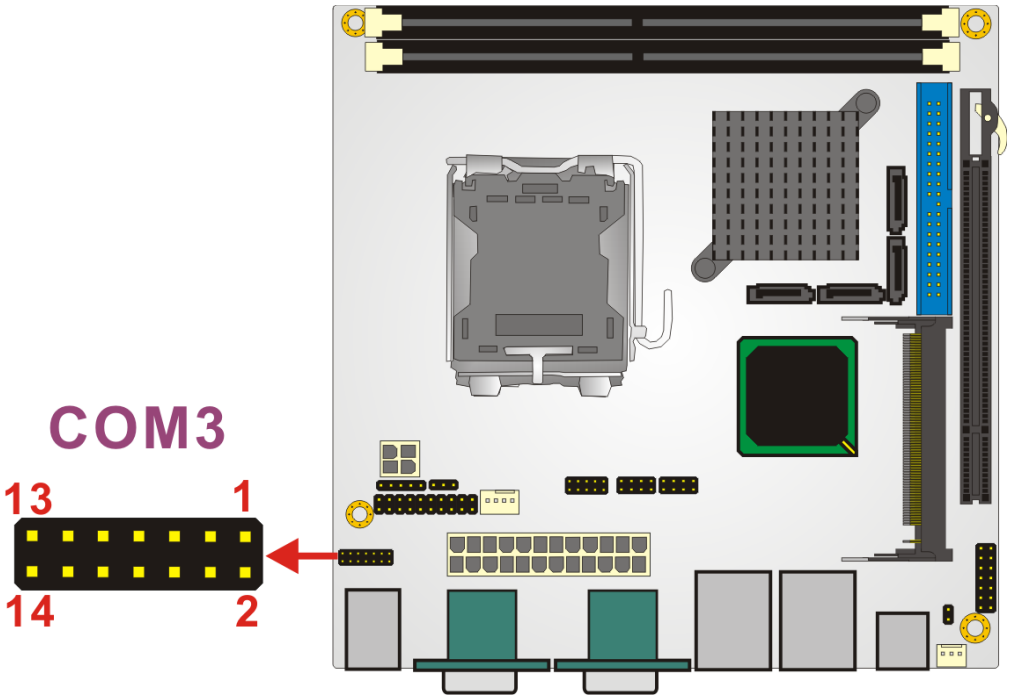


**Figure 3-11: Serial Port Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | DCD | 2 | DSR |
| 3 | RXD | 4 | RTS |
| 5 | TXD | 6 | CTS |
| 7 | DTR | 8 | RI |
| 9 | GROUND | 10 | NC |
| 11 | TX+ | 12 | TX- |
| 13 | RX+ | 14 | RX- |

**Table 3-15: Serial Port Connector Pinouts**

### 3.2.11 SATA Drive Connectors

CN Label: SATA_P0, SATA_P1, SATA_S0 and SATA_S1

CN Type: 1x7 pin SATA drive connectors

CN Location: See Figure 3-12

CN Pinouts: See Table 3-16

The four SATA drive connectors are connected to four SATA II drives. SATA II drives transfer data at speeds as high as 3.0Gb/s.

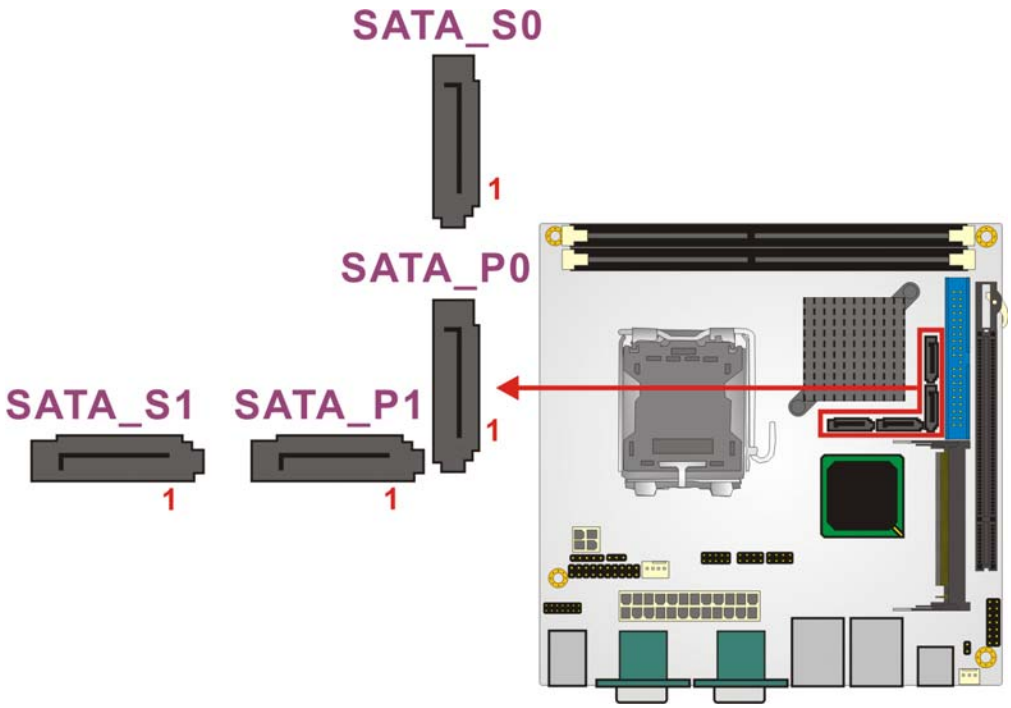


**Figure 3-12: SATA Drive Connector Locations**

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | TXP |
| 3 | TXN |
| 4 | GND |
| 5 | RXN |
| 6 | RXP |
| 7 | GND |

**Table 3-16: SATA Drive Connector Pinouts**

### 3.2.12 TPM Connector

CN Label: TPM1

CN Type: 20-pin connector

CN Location: See Figure 3-13

CN Pinouts: See Table 3-17

The TPM (Trusted Platform Module) connector is a device with a controller that is used to check authenticity of digital signs and keys as well as other encryption and security functions.

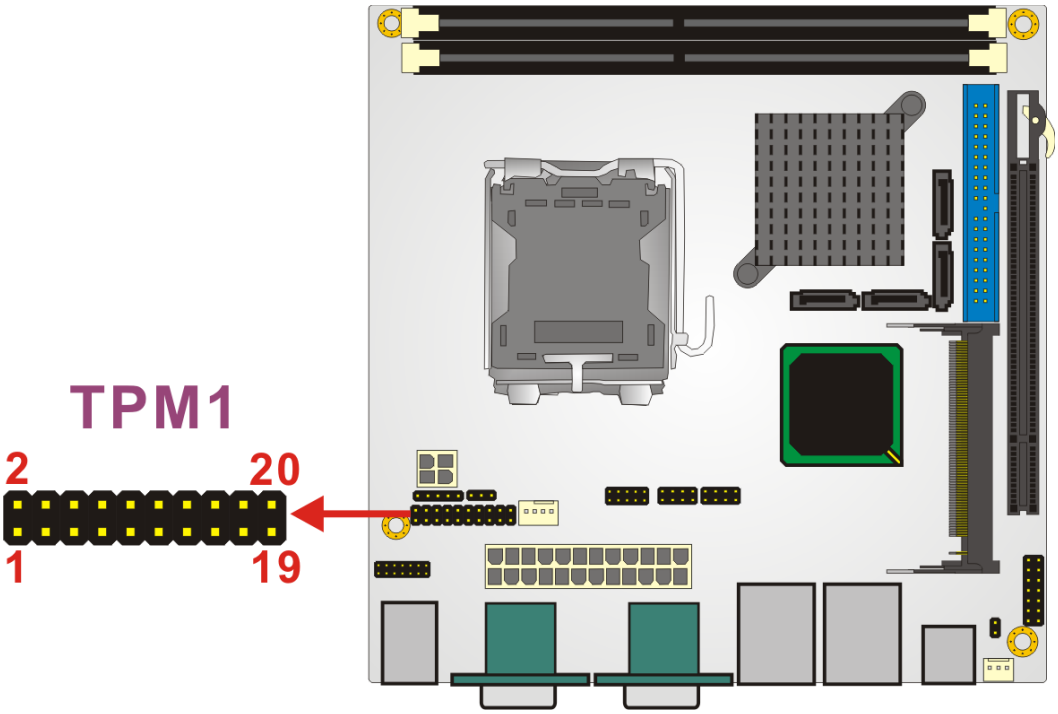


**Figure 3-13: TPM Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Clock | 2 | GND |
| 3 | Frame# | 4 | KEY |
| 5 | Reset# | 6 | +5V |
| 7 | LAD3 | 8 | LAD2 |
| 9 | +3.3V | 10 | LAD1 |
| 11 | LAD0 | 12 | GND |
| 13 | SCL | 14 | SDA |
| 15 | +3.3V SBY | 16 | Serial IRQ |
| 17 | GND | 18 | NC |

| | | | |
|---|---|---|---|
| 19 | Power Down# | 20 | DRQ# |

**Table 3-17: TPM Connector Pinouts**

### 3.2.13 Internal USB Connectors

CN Label: USB1 and USB2

CN Type: 8-pin header (2x4)

CN Location: See Figure 3-14

CN Pinouts: See Table 3-18

One 2x4 pin connector provides connectivity to two USB 2.0 ports. The USB ports are used for I/O bus expansion.

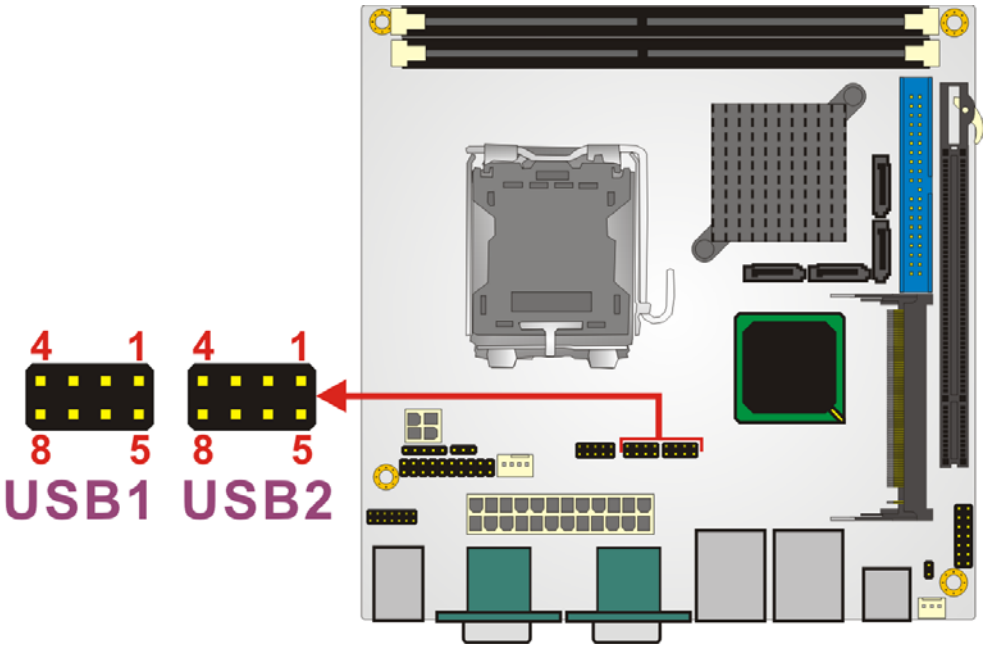


**Figure 3-14: Internal USB Connector Locations**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | USB Power | 5 | GND |
| 2 | DATA- | 6 | DATA+ |
| 3 | DATA+ | 7 | DATA- |

| | | | |
|---|---|---|---|
| 4 | GND | 8 | USB Power |

**Table 3-18: USB1 and USB2 Pinouts**

## 3.3 External Interface Connectors

The peripheral connectors on the back panel are connected to devices externally when the KINO-9454 is installed in a chassis. The peripheral connectors on the rear panel are:

- 2 x Audio jacks
- 1 x CRT connector
- 2 x RJ-45 Ethernet connectors
- 2 x Keyboard/mouse connectors
- 3 x Serial port connectors
- 4 x USB 2.0 connectors

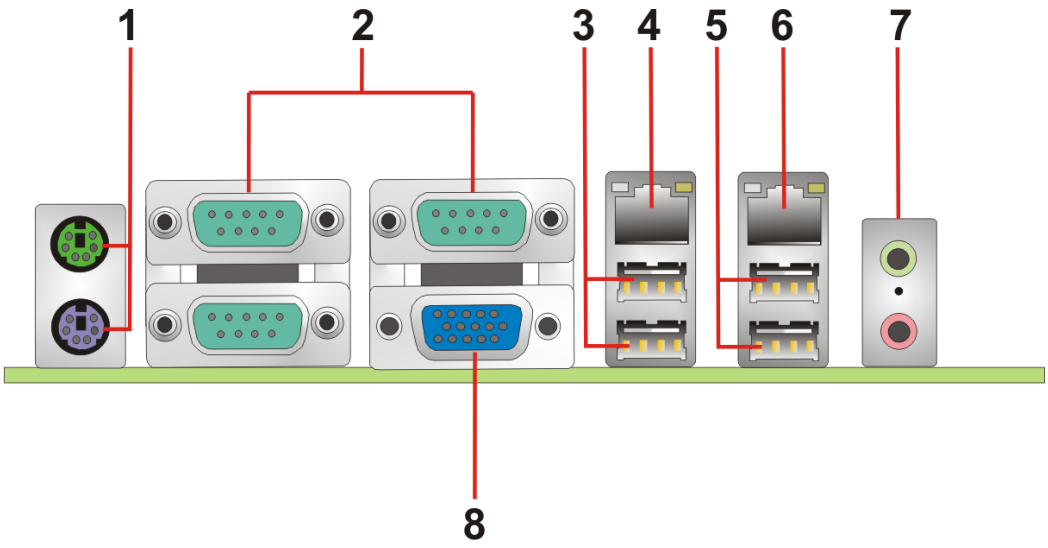


**Figure 3-15: KINO-9454 External Interface Connectors**

### 3.3.1 Audio Connectors

CN Label: CN3

CN Type: Audio jack

CN Location: See Figure 3-15 (labeled number 7)

CN Pinouts: See Figure 3-16

- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

**Figure 3-16: Audio Connector**

### 3.3.2 CRT Connector

CN Label: CN5

CN Type: 15-pin female connector

CN Location: See Figure 3-15 (labeled number 8)

CN Pinouts: See Table 3-19

The standard 15-pin VGA connector connects to a CRT or LCD display monitor.

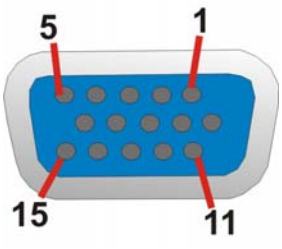


**Figure 3-17: VGA Connector**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | RED | 2 | GREEN |
| 3 | BLUE | 4 | NC |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | VCC/NC | 10 | GND |
| 11 | NC | 12 | DDC DAT |
| 13 | HSYNC | 14 | VSYNC |
| 15 | DDCCLK | | |

**Table 3-19: VGA Connector Pinouts**

### 3.3.3 Ethernet Connectors

CN Label: CN1 and CN2

CN Type: RJ-45

CN Location: See Figure 3-15 (labeled number 4 and 6)

CN Pinouts: See Table 3-20

The KINO-9454 is equipped with two built-in GbE Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 2 | TX0+ | 8 | TX3+ |
| 3 | TX0- | 9 | TX3- |
| 4 | TX1+ | 11 | Active- |
| 5 | TX2+ | 12 | Active+(Yellow) |
| 6 | TX2- | 13 | LINK (Green-10/100M) |
| 7 | TX1- | 14 | LINK (Orange-1G) |

**Table 3-20: LAN1 and LAN2 Pinouts**

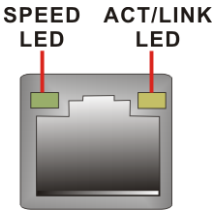


**Figure 3-18: RJ-45 Ethernet Connector**

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-21**.

| SPEED LED | | ACT/LINK LED | |
|---|---|---|---|
| STATUS | DESCRIPTION | STATUS | DESCRIPTION |
| GREEN | 10/100Mbps connection | YELLOW | Linked |
| ORANGE | 1Gbps connection | BLINKING | Data Activity |

**Table 3-21: RJ-45 Ethernet Connector LEDs**

### 3.3.4 Keyboard/Mouse Connector

CN Label: KBMS1

CN Type: PS/2 connector

CN Location: See Figure 3-15 (labeled number 1)

CN Pinouts: See Table 3-22

The KINO-9454 keyboard and mouse connectors are standard PS/2 connectors.

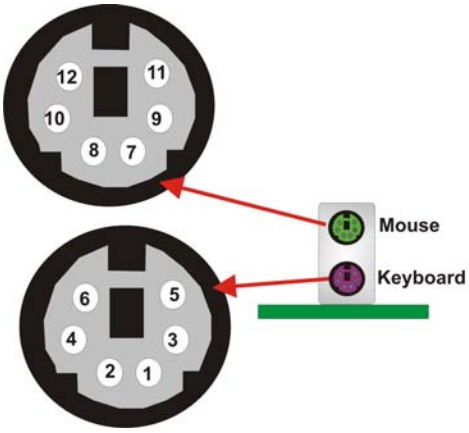


**Figure 3-19: PS/2 Pinouts**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | KB DATA | 7 | MS DATA |
| 2 | NC | 8 | NC |
| 3 | GROUND | 9 | GROUND |
| 4 | KB VCC | 10 | MS VCC |
| 5 | KB CLOCK | 11 | MS CLOCK |
| 6 | NC | 12 | NC |

**Table 3-22: PS/2 Connector Pinouts**

### 3.3.5 Serial Port Connectors

CN Label: CN4 and CN5

CN Type: DB-9

CN Location: See Figure 3-15 (labeled number 2)

CN Pinouts: See Table 3-23

The serial ports can be connected to a serial communications device directly.

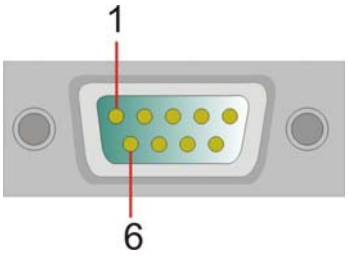


**Figure 3-20: External Serial Port Connector**

| PIN | Description |
|---|---|
| 1 | DATA CARRIER DETECT (DCD) |
| 2 | RECEIVE DATA (RXD) |
| 3 | TRANSMIT DATA (TXD) |
| 4 | DATA TERMINAL READY (DTR) |
| 5 | GROUND (GND) |
| 6 | DATA SET READY (DSR) |
| 7 | REQUEST TO SEND (RTS) |
| 8 | CLEAR TO SEND (CTS) |
| 9 | RING INDICATOR (RI) |

**Table 3-23: External Serial Port Pinouts**

### 3.3.6 USB Connectors

CN Label: CN1 and CN2

CN Type: USB port

CN Location: See Figure 3-15 (labeled number 3 and 5)

CN Pinouts: See Table 3-24

USB devices can be connected directly to the USB connectors on the rear panel.

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | VCC | 5 | VCC |
| 2 | DATA6- | 6 | DATA7- |

| | | | |
|---|---|---|---|
| 3 | DATA6+ | 7 | DATA7+ |
| 4 | GROUND | 8 | GROUND |

**Table 3-24: External USB Connector Pinouts**

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Chapter

4

# Installation and Configuration

## 4.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-9454. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the KINO-9454 (or any other electrical component) is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wrist band:*** Wearing a simple anti-static wrist band can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.

## 4.2 Installation Considerations

**NOTE:**

The following installation notices and installation considerations should be read and understood before the motherboard is installed. All installation notices pertaining to the installation of the motherboard should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the motherboard and injury to the person installing the motherboard.

### 4.2.1 Installation Notices

Before and during the installation of the KINO-9454, please **do** the following:

- Read the user manual
  - The user manual provides a complete description of the KINO-9454, installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD)
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the motherboard on an antistatic pad

- When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.

- Turn off all power to the KINO-9454
  - When working with the motherboard, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-9454 **DO NOT:**

- remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- use the product before verifying all the cables and power connectors are properly connected.
- allow screws to come in contact with the PCB circuit, connector pins, or its components.

## 4.3 Unpacking

**NOTE:**

If any of the items listed below are missing when the KINO-9454 is unpacked, do not proceed with the installation and contact the KINO-9454 reseller or vendor.

### 4.3.1 Unpacking Precautions

Before installing the KINO-9454, unpack the motherboard. Some components on KINO-9454 are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged, follow these precautions:

- The user should ground them self to remove any static charge before touching the KINO-9454. To do so wear a grounded wrist strap at all times or frequently touch any conducting materials that is connected to the ground.
- Handle the KINO-9454 by its edges. Do not touch the IC chips, leads or circuitry if not necessary.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

### 4.3.2 Checklist

When unpacking the KINO-9454, please make sure that the package contains the following items.

- 1 x KINO-9454 single board computer
- 1 x IDE flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x Quick Installation Guide
- PCI Express Graphic Card (optional)
- RS-232/422/485 cable (optional)
- CPU cooler (optional)
- USB cable (optional)

If one or more of these items are missing, please contact the reseller or vendor the KINO-9454 was purchased from and do not proceed any further with the installation.

## 4.4 KINO-9454 motherboard Installation

**WARNING!**

1. Never run the motherboard without an appropriate heat sink and cooler that can be ordered from IEI Technology or purchased separately.
2. Be sure to use the CPU 12V power connector for the CPU power.

**WARNING!**

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the motherboard components

and injury to the user.

**WARNING!**

When installing electronic components onto the motherboard always take the following anti-static precautions in order to prevent ESD damage to the motherboard and other electronic components like the CPU and DIMM modules

The following components must be installed onto the motherboard or connected to the motherboard during the installation process.

- CPU
- CPU cooling kit
- DDR2 memory modules
- Peripheral device connection

## 4.5 Socket LGA775 CPU Installation

### 4.5.1 CPU Selection: HT Functionality Requirements

Enabling Hyper-Threading Technology on your system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Pentium 4 Processor with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology (that has been met by the KINO-9454)
- **OS**: An operating system that has optimizations for HT Technology

#### 4.5.1.1 CPU Installation

**WARNING:**

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure that a heat sink and CPU cooling fan are

properly installed before the KINO-9454 is run.

If a heat sink and cooling fan are not properly installed both the CPU and the board may be damaged.

The LGA775 socket is shown in **Figure 4-1**.

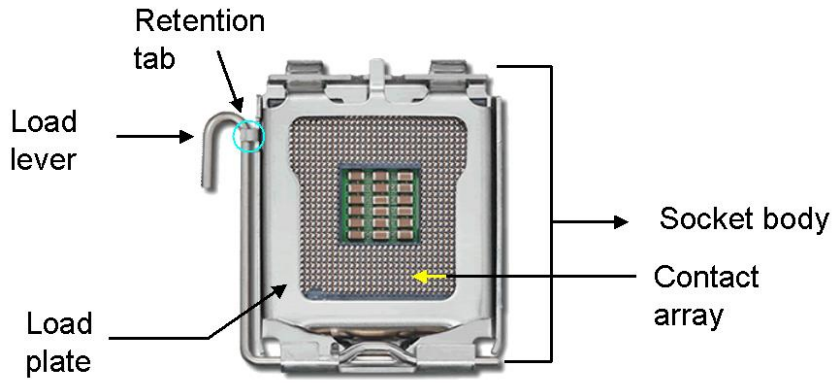



**Figure 4-1: Intel LGA775 Socket**

**WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

To install Socket LGA775 CPU onto the KINO-9454, follow the steps below:

**Step 1:** **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use the fingernail to pry the protective cover off. (See **Figure 4-2**)

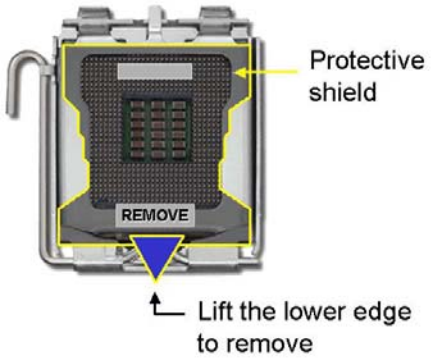



**Figure 4-2: Remove the CPU Socket Protective Shield**

**Step 2:** **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction. (See **Figure 4-3**)

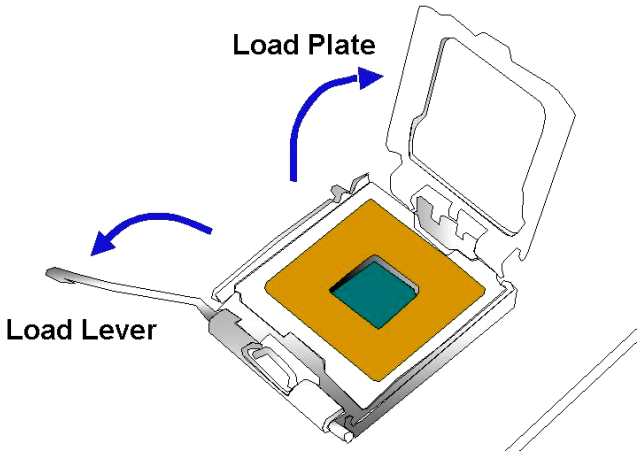



**Figure 4-3: Open the CPU Socket Load Plate**

**Step 3:** **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

**Step 4:** **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

**Step 5:** **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

**Step 6:** **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

**Step 7:** **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-4**.

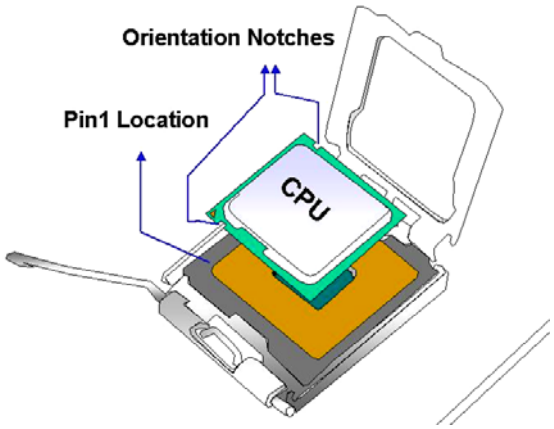



**Figure 4-4: Insert the Socket LGA775 CPU**

**Step 8:** **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

**Step 9:** **Connect the CPU power connector.** Connect the CPU 12V cable to the CPU 12V power connector after the cooling kit is installed.

### 4.5.2 Socket LGA775 Cooling Kit Installation

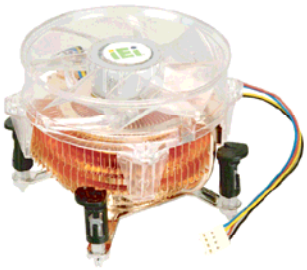
**WARNING:**

**It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the KINO-9454.**

The KINO-9454 is vertically mounted on a horizontal backplane, and Intel's heat sink does not come with a support bracket on the soldering side, the PCB may be bent by the weight of the cooling kit.

IEI's cooling kit (CF-520 and CF-775A) includes a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

**CF-520-RS**



**CF-775A-RS**

**Figure 4-5: IEI LGA-775 Cooling Kit**

The IEI LGA775 CPU cooling kit (CF-520 and CF-775A) shown in **Figure 4-5** comprises a CPU heat sink and a cooling fan.

**NOTE:**

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the CF-520 heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit follow the instructions below.

**Step 1:** **Place the cooling kit onto the socket LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

**Step 2:** **Properly align the cooling kit**. Make sure the four spring screw fasteners can

pass through the pre-drilled holes on the PCB.

**Step 3:** **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

**Step 4:** **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 4-6**)

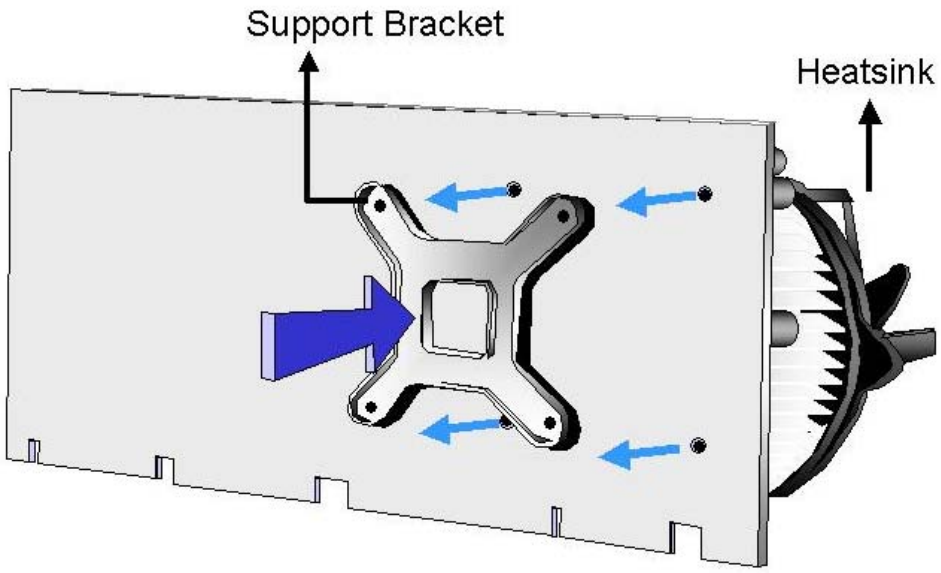



**Figure 4-6: Securing the Heat sink to the PCB Board**

**Step 5:** **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

**Step 6:** **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the KINO-9454. Carefully route the cable and avoid heat generating chips and fan blades.

### 4.5.3 DIMM Module Installation

#### 4.5.3.1 Purchasing the Memory Module

**WARNING!**

When purchasing the DIMM modules, make sure the modules are compatible with the DIMM slot specified in **Section 2.6 Memory Support**.

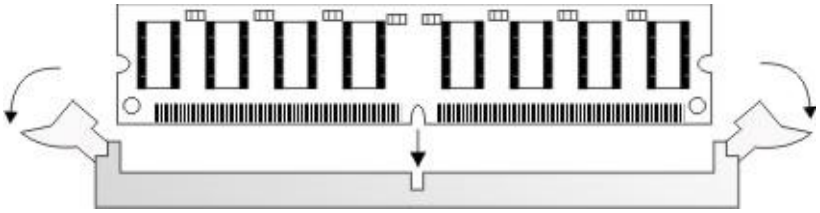
**WARNING!**

The board supports DDR2 DIMM modules only. DDR1 and DDR2 are not compatible. If a DDR1 DIMM module is installed, the system may be damaged and become inaccessible. Please only use DDR2 DIMM modules.

#### 4.5.3.2 DIMM Module Installation

The KINO-9454 has four DDR2 SDRAM DIMM sockets. Follow the steps below to install the DIMM module.

**Step 1:** Make sure the two handles of the DIMM socket are in the "open" position, leaning outward (**Figure 4-7**).



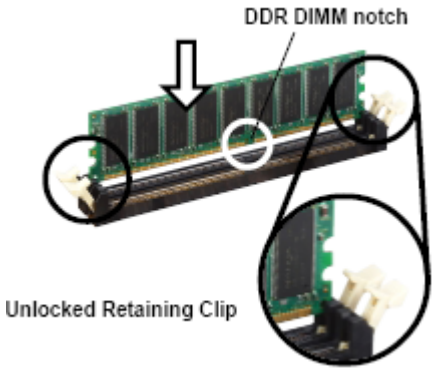



**Figure 4-7: Installing the DIMM Module**

**Step 2:** Slowly slide the DIMM module along the plastic guides on both ends of the socket. Press the DIMM module down into the socket until it clicks into position and the two handles have automatically locked the memory module into place (**Figure 4-8**).

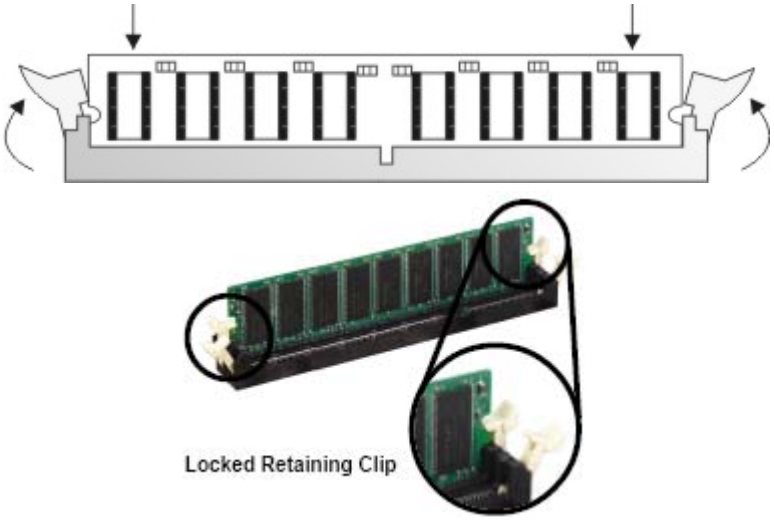



**Figure 4-8: Locking the DIMM Module**

**Step 3:** To remove the memory module, push both handles outward, and the memory module is ejected by the mechanism in the socket.

### 4.5.4 Peripheral Device Connection

Cables provided by IEI that connect peripheral devices to the motherboard are listed in **Table 4-1**. Cables not included in the kit must be separately purchased.

| Quantity | Type |
|---|---|
| 1 | IDE flat cable |
| 2 | SATA cables |
| 1 | SATA power cable |

**Table 4-1: IEI Provided Cables**

### 4.5.4.1 IDE Disk Drive Connector (IDE1)

The cable used to connect the motherboard to the IDE device is a standard 40-pin ATA/100 flat cable. To connect an IDE device to the motherboard, follow the instructions below.

**Step 1:** Find the IDE flat cable in the kit that came with the motherboard.

**Step 2:** Connect one end of the cable to the IDE connector on the motherboard. A keyed pin on the IDE connector prevents it from being connected incorrectly.

**Step 3:** Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.

**Step 4:** Connect the other side of the cable to the IDE device making sure that the pin 1 cable corresponds to pin 1 on the connector.

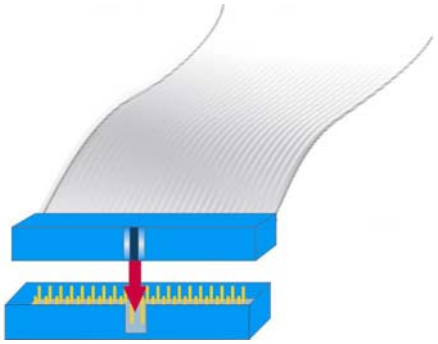


**Figure 4-9: Connection of IDE Connector**

**NOTE:**

When two IDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

#### 4.5.4.2 COM Port Connectors

The KINO-9454 provides four serial ports interfaced through one 14-pin male headers (COM3) and three DB-9 connector. The serial ports facilitate the connection to serial devices or a communications network, e.g., terminal console.

## 4.6 On-board Jumpers

**NOTE:**

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

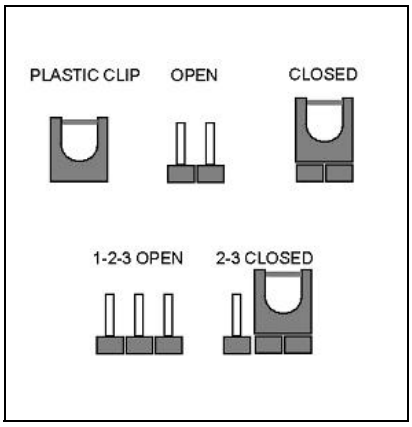



**Figure 4-10 Jumper**

The KINO-9454 motherboard has two on-board jumpers. The jumpers are described in **Table 4-2**.

| Description | Label | Type |
|---|---|---|
| Clear CMOS | JP5 | 2-pin header |
| COM2 mode selection | JP2 | 3-pin header |

**Table 4-2: On-board Jumpers**

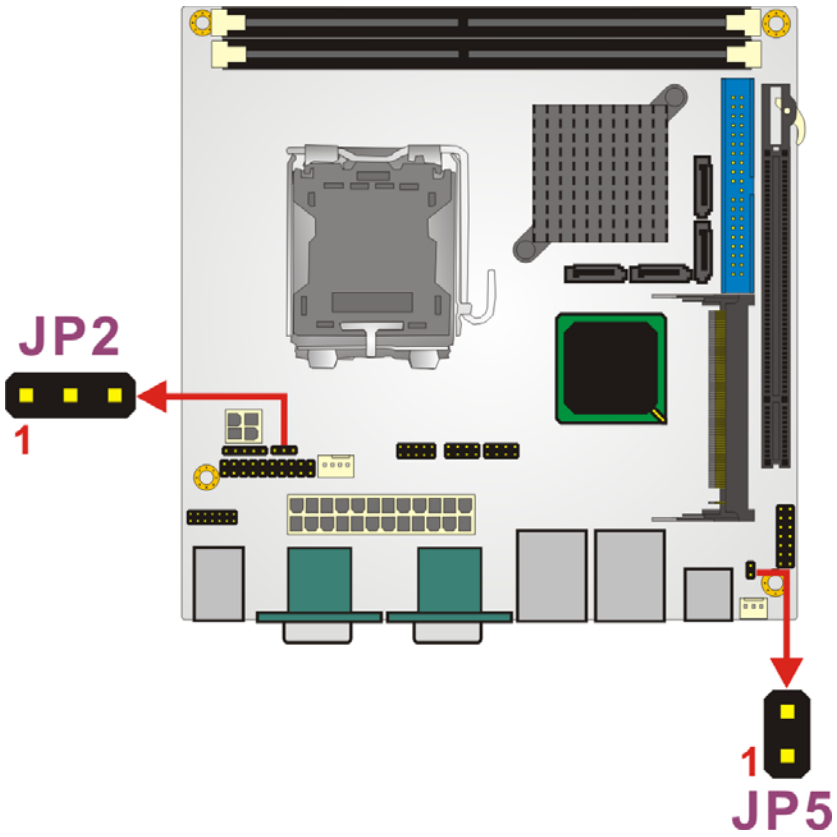



**Figure 4-11: Jumper Locations**

### 4.6.1 Clear CMOS Jumper

| | |
|---|---|
| Jumper Label: | JP5 |
| Jumper Type: | 2-pin header |
| Jumper Settings: | See Table 4-3 |
| Jumper Location: | See Figure 4-11 |

If the KINO-9454 fails to boot due to improper BIOS settings, use this jumper to clear the CMOS data and reset the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

| Clear CMOS | DESCRIPTION |
|---|---|
| Open | Normal Operation (Default) |
| Closed | Clear CMOS Setup |

**Table 4-3: Clear CMOS Jumper Settings**

The clear CMOS jumper is located in **Figure 4-11**.

### 4.6.2 COM2 Mode Selection

Jumper Label: JP2

Jumper Type: 3-pin header

Jumper Settings: See Table 4-4

Jumper Location: See Figure 4-11

This jumper configures the COM2 connector as an RS-232 serial port or an RS-422/RS-485 serial port. The selection options are shown in **Table 4-4**.

| JP2 | DESCRIPTION |
|---|---|
| Short 1-2 | RS-232 (Default) |
| Short 2-3 | RS-422/RS-485 |

**Table 4-4: JP2 Jumper Settings**

## 4.7 Chassis Installation

After the CPU, the cooling kit, and the DIMM modules have been installed and after the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configure, the motherboard can be mounted into chassis.

To mount the motherboard into a chassis please refer to the chassis user guide that came with the product.

## 4.8 Rear Panel Connectors

### 4.8.1 LCD Panel Connection

The conventional CRT monitor connector is a 15-pin, female D-SUB connector. Pin assignments can be seen in that can be connected to external monitors.

### 4.8.2 Ethernet Connection

The rear panel RJ-45 connectors can be connected to an external LAN and communicate with data transfer rates up to 1Gb/s.

### 4.8.3 USB Connection

The rear panel USB connectors provide easier and quicker access to external USB devices. The rear panel USB connector is a standard connector and can easily be connected to other USB devices.

### 4.8.4 Serial Connection

The rear panel serial connector (COM1) provides easy and quick access to external serial devices.

### 4.8.5 Keyboard and Mouse Connection

A PS/2 keyboard and a PS/2 mouse can be connected to the appropriate PS/2 connector on the rear panel.

### 4.8.6 Audio Interface

AC'97 Audio signals are interfaced through the audio jack connectors. The signals include microphone line-in, line-in stereo and speaker out stereo.

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Chapter

5

# AMI BIOS Setup

## 5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

### 5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before, restart the computer and try again.

### 5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the "+" and "-" keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

| Key | Function |
|---|---|
| Up arrow | Move to previous item |
| Down arrow | Move to next item |
| Left arrow | Move to the item on the left hand side |
| Right arrow | Move to the item on the right hand side |
| Esc key | Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| "+" key | Increase the numeric value or make changes |
| "-" key | Decrease the numeric value or make changes |
| F1 key | General help, only for Status Page Setup Menu and Option Page Setup Menu |

| | |
|---|---|
| F2 /F3 key | Change color from total 16 colors. F2 to select color forward. |
| F10 key | Save all the CMOS changes, only for Main Menu |

**Table 5-1: BIOS Navigation Keys**

### 5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

### 5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 4**, **Section 4.6.1**.

### 5.1.5 BIOS Menu Bar

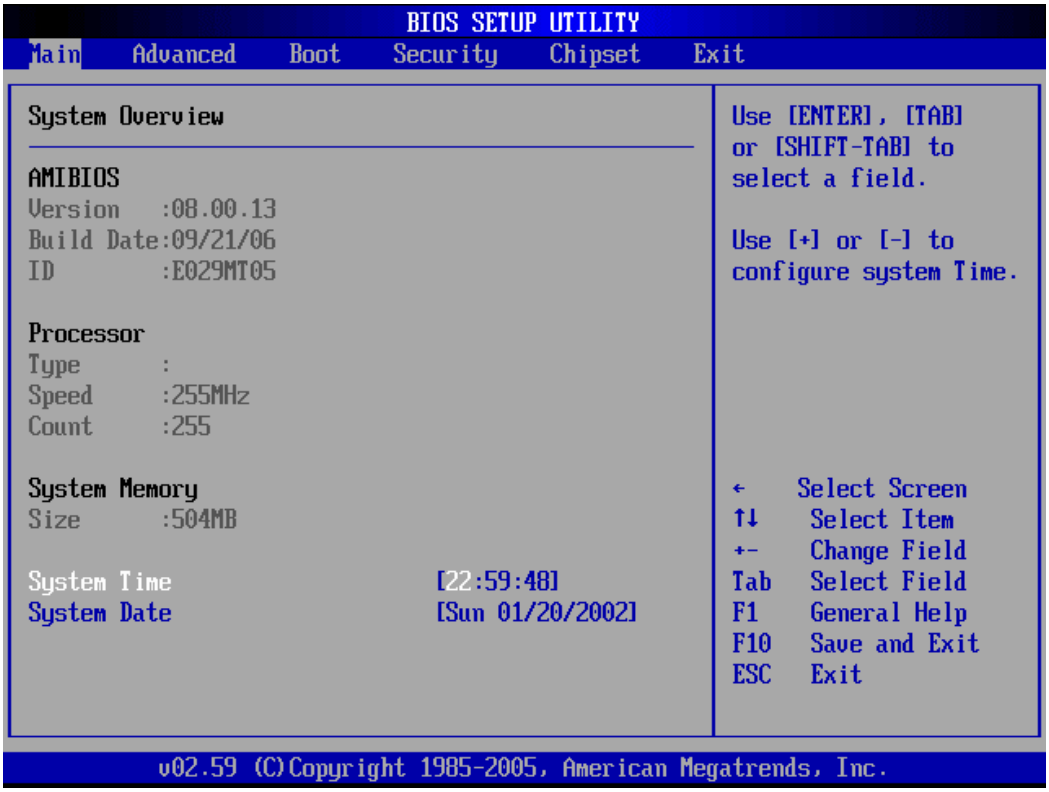
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

## 5.2 Main

When the **BIOS Setup** program is entered, the **Main** menu (**BIOS Menu 1**) appears. The **Main** menu gives an overview of the basic system information.




**BIOS Menu 1: Main**

➔ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

- **System Time [xx:xx:xx]**: The system time is set here.
- **System Date [Day xx/xx/xxxx]:** The system date is set here.

## 5.3 Advanced

The **Advanced** menu (**BIOS Menu 2**) allows access to the CPU and peripheral device configuration options through the following sub-menus:

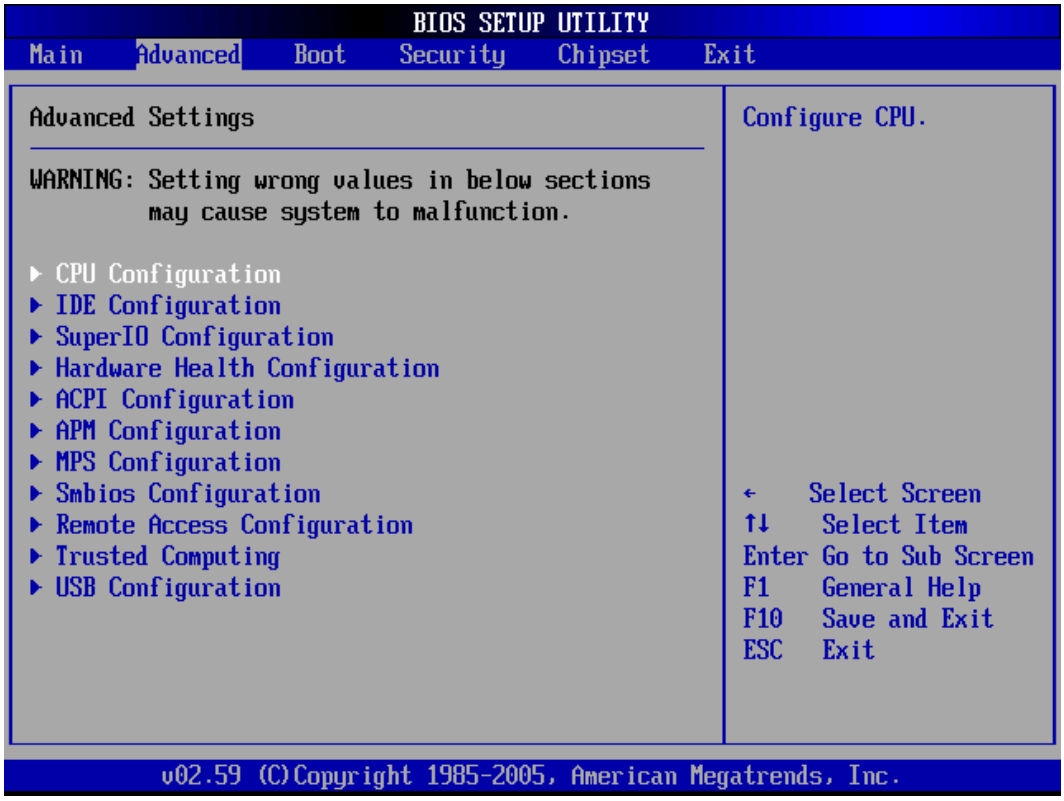
---

**WARNING:**

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

---

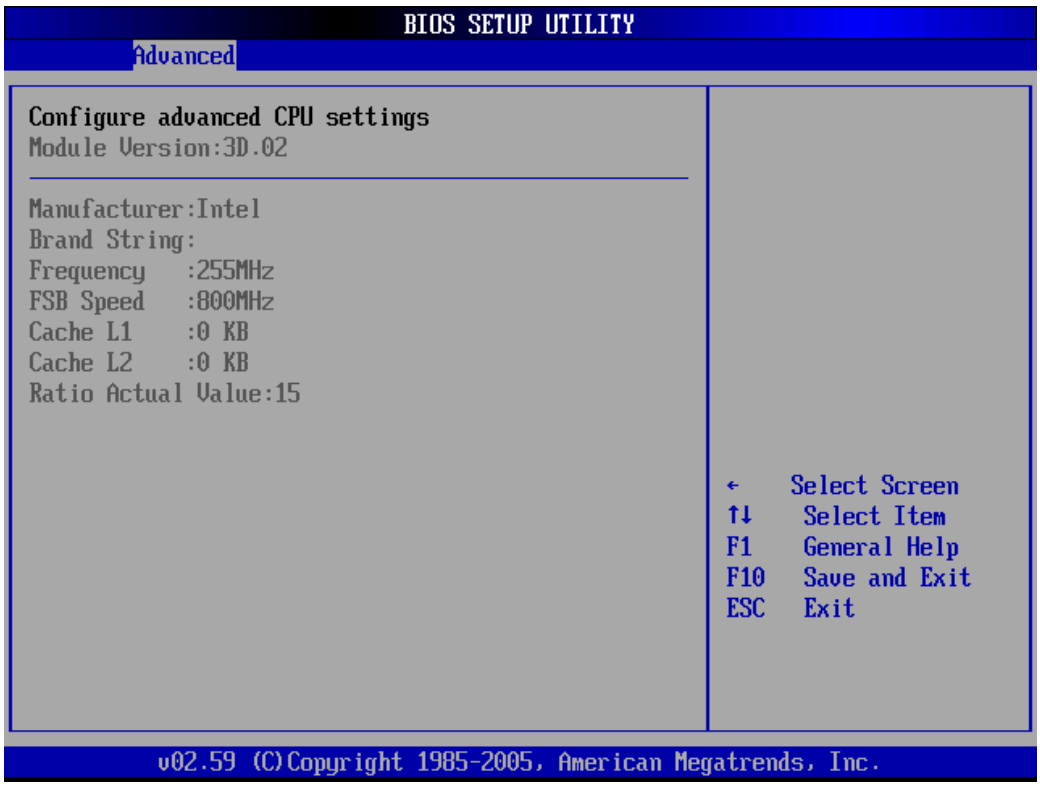
- CPU Configuration (see Section 5.3.1)
- IDE Configuration (see Section 5.3.2)
- SuperIO Configuration (see Section 5.3.3)
- Hardware Health Configuration (see Section 5.3.4)
- ACPI Configuration (see Section 5.3.5)
- APM Configuration (see Section 5.3.6)
- MPS Configuration (see Section 5.3.7)
- Smbios (see Section 5.3.8)
- Remote Access Configuration (see Section 5.3.9)
- USB Configuration (see 5.3.10)




**BIOS Menu 2: Advanced**

### 5.3.1 CPU Configuration

The **CPU Configuration** menu (**BIOS Menu 3**) shows detailed CPU specifications and CPU configuration options.



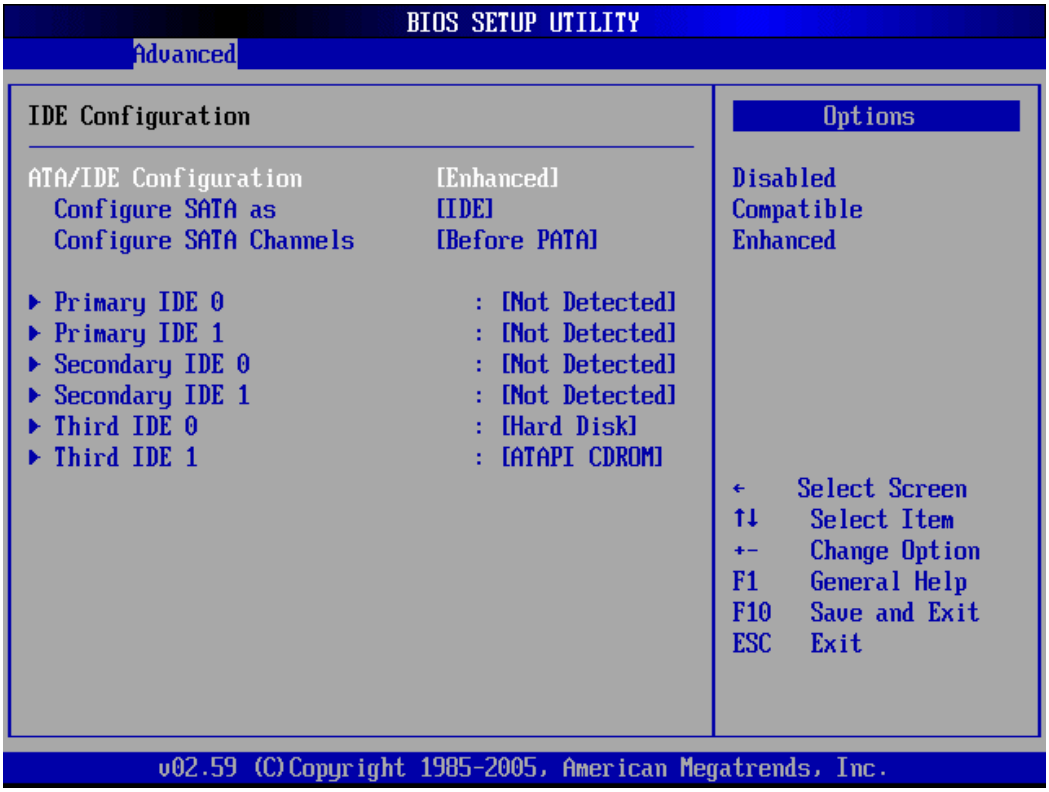

**BIOS Menu 3: CPU Configuration**

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- **Ratio Actual Value**: Lists the actual CPU ratio

### 5.3.2 IDE Configuration

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system.




**BIOS Menu 4: IDE Configuration**

➔ **ATA/IDE Configuration [Enhanced]**

The ATA/IDE Configuration BIOS option allows the user to configure the ATA/IDE device mode.

➔ **Disabled** Disable all ATA/IDE ports. No Primary/Secondary IDE mode is presented for configuration

➔ **Compatible** If this option is selected, “Legacy IDE Channels” option is presented for configuration.

➔ **Enhanced** **DEFAULT** If this option is selected, “Configure SATA as” and “Configure SATA channels” options are presented for configuration.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to specify how to configure the available SATA devices.

| | | |
|---|---|---|
| ➔ **IDE** | **DEFAULT** | Enables the SATA devices as IDE devices |
| ➔ **RAID** | | Enables the SATA devices as a RAID device |
| ➔ **AHCI** | | Enables Native Command Queuing (NCQ) and SATA hot plug capability<br>If AHCI is chosen, enable the stagger Spinup Support and take all hard disks on board as master |

➔ **Configure SATA Channels [Before PATA]**

Use **Configure SATA Channels** option to specify how to configure the available SATA devices.

| | | |
|---|---|---|
| ➔ **Before PATA** | **DEFAULT** | The system detects the SATA devices before the IDE devices |
| ➔ **Behind PATA** | | The system detects the SATA devices after the IDE devices |

➔ **IDE Master and IDE Slave**

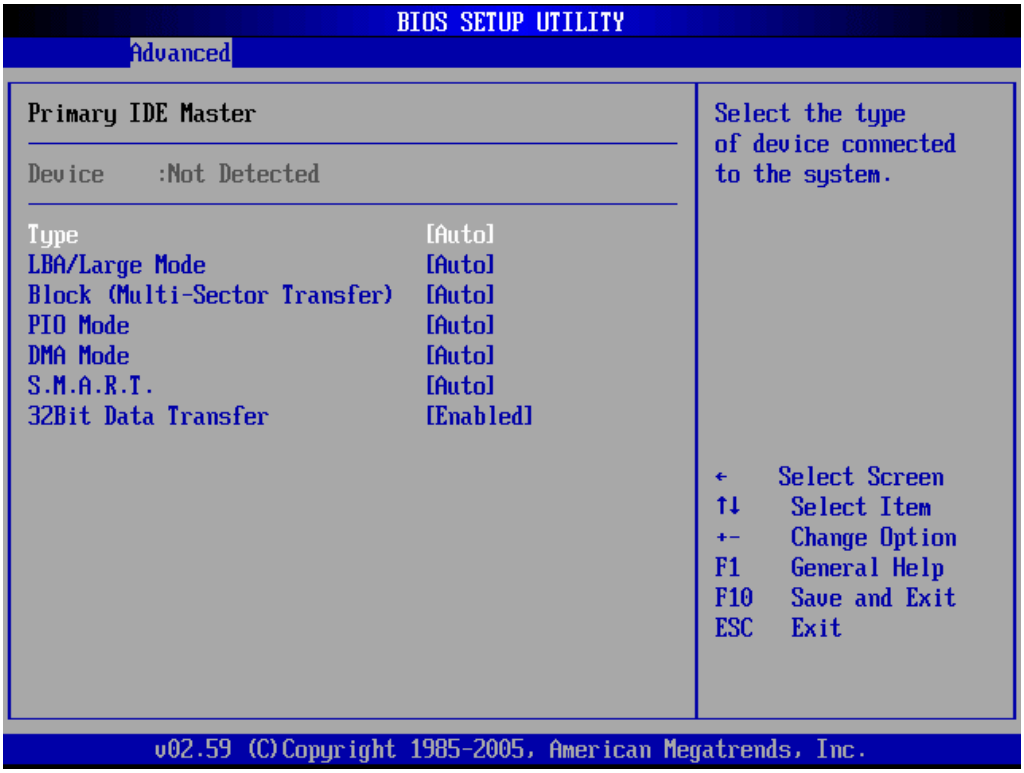
When entering setup, BIOS auto detects the presence of IDE devices. This displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE 0
- Primary IDE 1
- Secondary IDE 0
- Secondary IDE 1
- Third IDE 0
- Third IDE 1

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

### 5.3.2.1 IDE Master, IDE Slave

IDE Master and IDE Slave configuration options for both primary and secondary IDE devices are shown in the BIOS menu below.




**BIOS Menu 5: IDE Master and IDE Slave Configuration**

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Vendor**: Lists the device manufacturer

- **Size**: The size of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

➔ **Type [Auto]**

The **Type** BIOS option determines the type of device that the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) has completed.

➔ **Not Installed** Selecting this value prevents the BIOS from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** This selection enables the BIOS to auto detect the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

➔ **ZIP**

➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

The **LBA/Large Mode** BIOS option disables or auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** This selection prevents the BIOS from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** This option allows the BIOS to auto detect the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

➔ **Disabled** Selecting this option prevents the BIOS from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** Selecting this value to allows the BIOS to auto detect the device support for Multi-Sector Transfers on the specified channel. If supported. Select this value to allow the BIOS to auto detect the number of sectors per block for transfer from the hard disk drive to the memory. The data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

The **PIO Mode** option selects the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** This setting allows the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

- ➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps
- ➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps
- ➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps
- ➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps
- ➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

  (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

The **DMA Mode** BIOS selection adjusts the DMA mode options.

- ➔ **Auto** **DEFAULT** The BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **S.M.A.R.T [Auto]**

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS to auto detects if the hard disk drive supports S.M.A.R.T. Use this setting if the IDE disk drive support cannot be determined.
- ➔ **Disabled** Select this value to prevent the BIOS from using the SMART feature.
- ➔ **Enabled** Select this value to allow the BIOS to use the SMART feature on support hard disk drives.

➔ **32Bit Data Transfer [Enabled]**

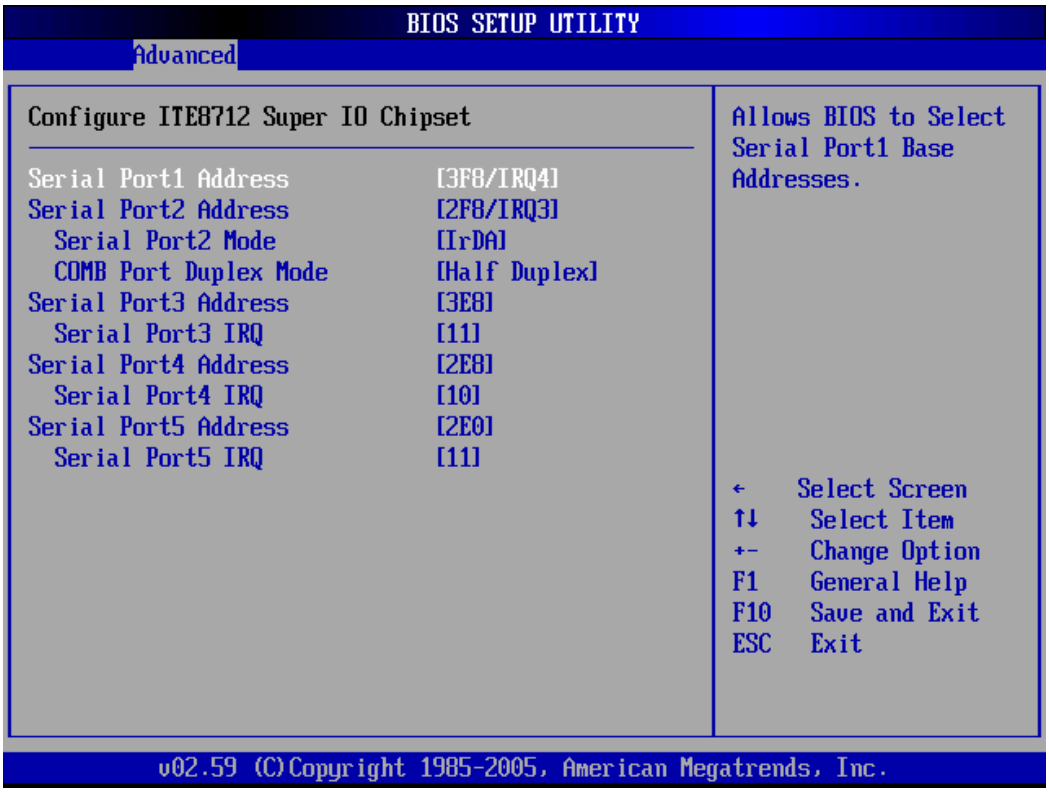
The **32Bit Data Transfer** BIOS option enables or disables 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on support hard disk drives.

### 5.3.3 Super IO Configuration

The **Super IO Configuration** menu (**BIOS Menu 6**) sets or changes the configurations for the FDD controllers, parallel ports and serial ports.


BIOS SETUP UTILITY
Advanced
Configure ITE8712 Super IO Chipset
Serial Port1 Address [3F8/IRQ4]
Serial Port2 Address [2F8/IRQ3]
Serial Port2 Mode [IrDA]
COMB Port Duplex Mode [Half Duplex]
Serial Port3 Address [3E8]
Serial Port3 IRQ [11]
Serial Port4 Address [2E8]
Serial Port4 IRQ [10]
Serial Port5 Address [2E0]
Serial Port5 IRQ [11]
Allows BIOS to Select Serial Port1 Base Addresses.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

**BIOS Menu 6: Super IO Configuration**

➔ **Serial Port1 Address [3F8/IRQ4]**

The **Serial Port1 Address** option allows BIOS to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt

address is IRQ4

- **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

The **Serial Port2 Address** option allows BIOS to select the Serial Port 2 base address.

- **Disabled** No base address is assigned to Serial Port 2
- **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [IrDA]**

Allows BIOS to select the mode for Serial Port 2

- **IrDA** **DEFAULT** Serial Port 2 mode is IrDA

➔ **COMB Port Duplex Mode [Half Duplex]**

Allows BIOS to select the transfer mode for COMB port.

- **Full Duplex** COMB port transfer mode is full duplex
- **Half Duplex** **DEFAULT** COMB port transfer mode is half duplex

➔ **Serial Port3 Address [3E8]**

This option allows BIOS to select the base addresses for serial port 3

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- ➔ **2E8** Serial port 3 I/O port address is 2E8
- ➔ **2F0** Serial port 3 I/O port address is 2F0
- ➔ **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

The **Serial Port3 IRQ** selection sets the interrupt address for serial port 3.

- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

This option allows BIOS to select the base addresses for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 4
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8
- ➔ **2F0** Serial port 4 I/O port address is 2F0
- ➔ **2E0** Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

The **Serial Port4 IRQ** selection sets the interrupt address for serial port 4.

- ➔ **10** **DEFAULT** Serial port 4 IRQ address is 10

- ➔ **11** Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [2E0]**

This option allows BIOS to select the base addresses for serial port 5.

- ➔ **Disabled** No base address is assigned to serial port 5
- ➔ **3E8** Serial port 5 I/O port address is 3E8
- ➔ **2E8** Serial port 5 I/O port address is 2E8
- ➔ **2F0** Serial port 5 I/O port address is 2F0
- ➔ **2E0** **DEFAULT** Serial port 5 I/O port address is 2E0

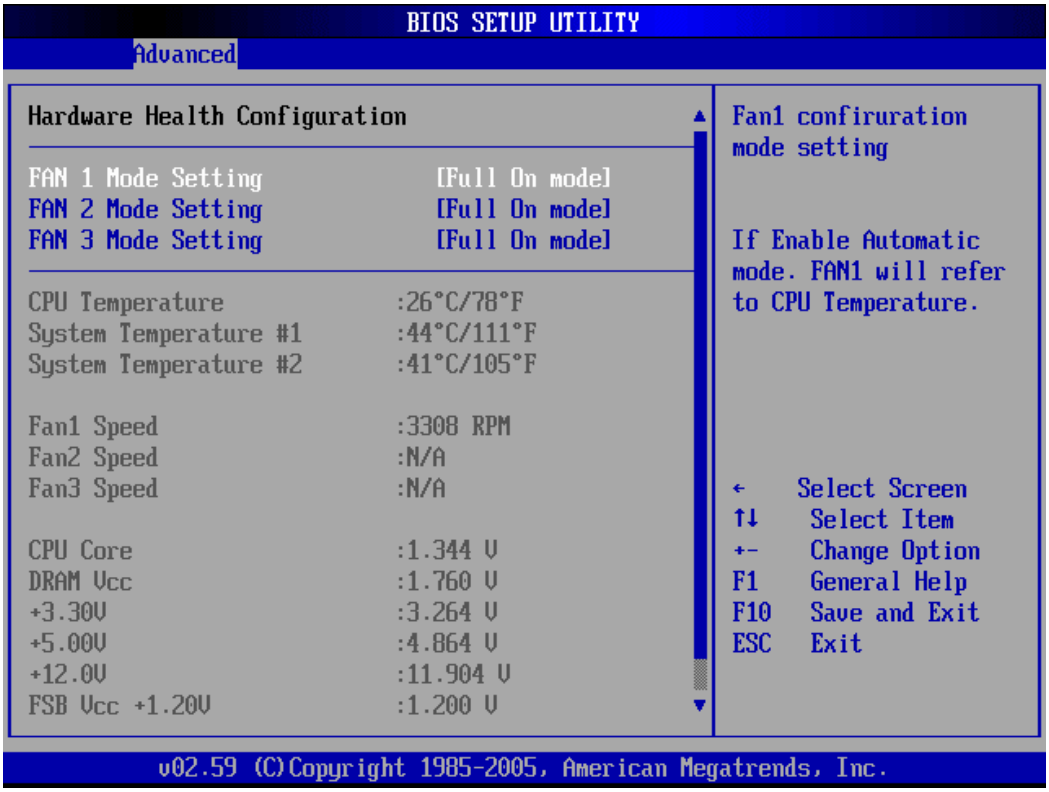
➔ **Serial Port5 IRQ [11]**

The **Serial Port5 IRQ** selection sets the interrupt address for serial port 5.

- ➔ **10** Serial port 5 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 5 IRQ address is 11

### 5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.


BIOS SETUP UTILITY
Advanced
Hardware Health Configuration
FAN 1 Mode Setting [Full On mode]
FAN 2 Mode Setting [Full On mode]
FAN 3 Mode Setting [Full On mode]
CPU Temperature :26°C/78°F
System Temperature #1 :44°C/111°F
System Temperature #2 :41°C/105°F
Fan1 Speed :3308 RPM
Fan2 Speed :N/A
Fan3 Speed :N/A
CPU Core :1.344 V
DRAM Vcc :1.760 V
+3.30V :3.264 V
+5.00V :4.864 V
+12.0V :11.904 V
FSB Vcc +1.20V :1.200 V
Fan1 confiruration mode setting
If Enable Automatic mode. FAN1 will refer to CPU Temperature.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

**BIOS Menu 7: Hardware Health Configuration**

➔ **FAN 1 Mode Setting: [Full On]**

The **FAN 1 Mode Setting** has the following options:

➔ **Full On** **DEFAULT** If selected, there are no additional configurable options.

➔ **Automatic Mode** If selected, the following options will appear with values that can be configured:

- ➔ **Temperature 1 Limit of OFF**
- ➔ **Temperature 1 Limit of Start**
- ➔ **Temperature 1 Limit of Full**
- ➔ **Fan 1 Start PWM**
- ➔ **Slop PWM 1:** 0 PWM, 1 PWM (Default), 2 PWM, 4 PWM, 8 PWM, 16 PWM, 32 PWM or 64 PWM

➔ **FAN 2 Mode Setting: [Full On]**

The **FAN 2 Mode Setting** has the following options:

➔ **Full On** **DEFAULT** If selected, there are no additional configurable options.

➔ **Automatic Mode** If selected, the following options will appear with values that can be configured:

- ➔ **Temperature 2 Limit of OFF**
- ➔ **Temperature 2 Limit of Start**
- ➔ **Temperature 2 Limit of Full**
- ➔ **Fan 2 Start PWM**
- ➔ **Slop PWM 2:** 0 PWM, 1 PWM (Default), 2 PWM, 4 PWM, 8 PWM, 16 PWM, 32 PWM or 64 PWM

➔ **FAN 3 Mode Setting: [Full On]**

The **FAN 3 Mode Setting** has the following options:

➔ **Full On** **DEFAULT** If selected, there are no additional configurable options.

➔ **Automatic Mode** If selected, the following options will appear with values that can be configured:

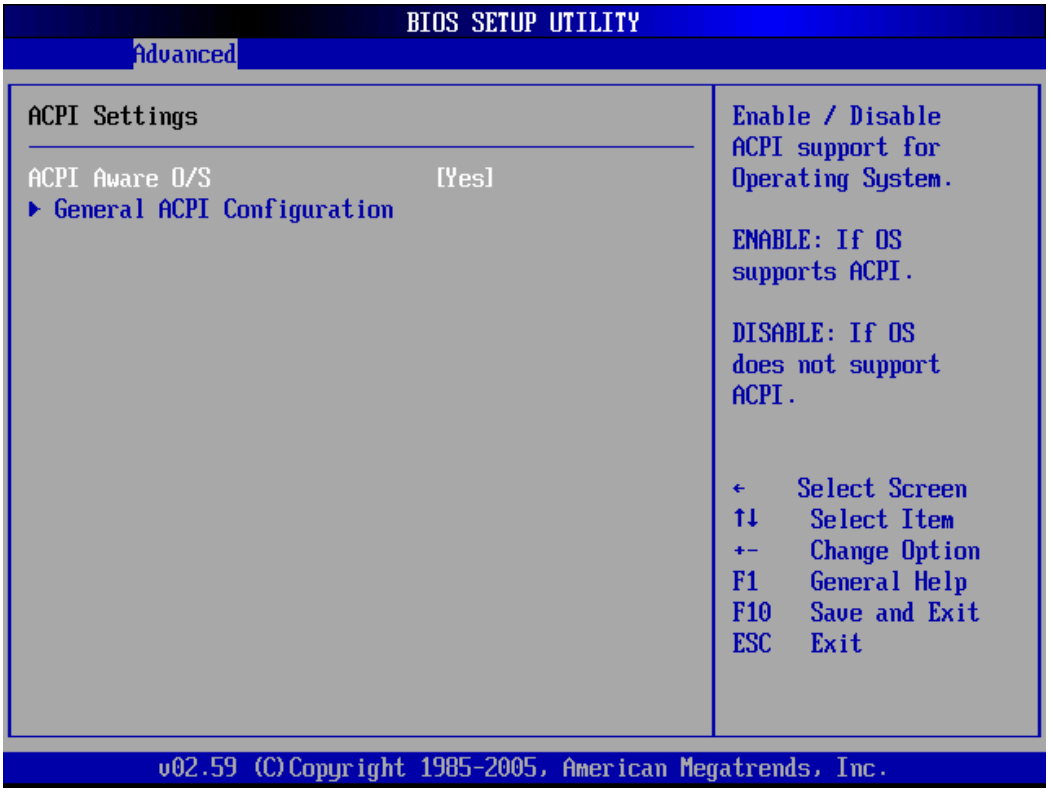
- ➔ **Temperature 3 Limit of OFF**
- ➔ **Temperature 3 Limit of Start**
- ➔ **Temperature 3 Limit of Full**
- ➔ **Fan 3 Start PWM**
- ➔ **Slop PWM 3:** 0 PWM, 1 PWM (Default), 2 PWM, 4 PWM, 8 PWM, 16 PWM, 32 PWM or 64 PWM

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed
  - Fan2 Speed
  - Fan3 Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - DRAM Vcc
  - +3.30V
  - +5.00V
  - +12.0V
  - FSB Vcc +1.20V
  - +1.50V
  - VBAT

### 5.3.5 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.




**BIOS Menu 8: ACPI Configuration**

➔ **ACPI Aware O/S [Yes]**

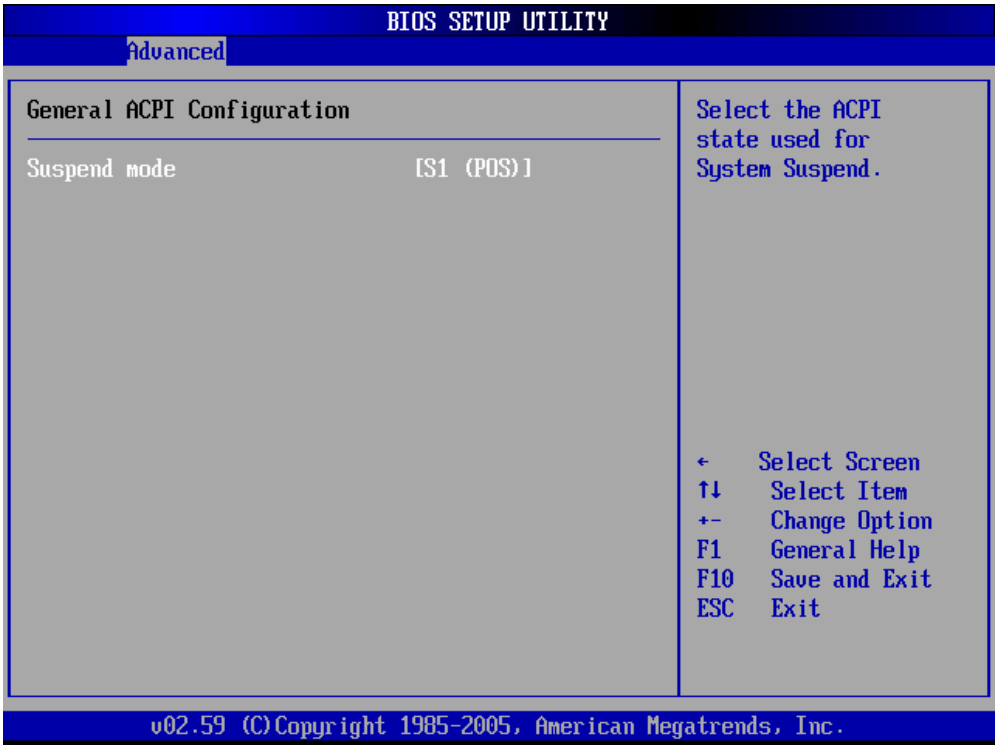
Use the **ACPI Aware O/S** option to enable the system to configure ACPI power saving options. ACPI can only be implemented if the system OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

➔ **No** Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

➔ **Yes** **DEFAULT** Enables the ACPI support for the operating system. This selection should be enabled if the OS does support ACPI

### 5.3.5.1 General ACPI Configuration

Use the **General ACPI Configuration** menu (**BIOS Menu 9**) to select the ACPI state when the system is suspended.




**BIOS Menu 9: General ACPI Configuration [Advanced\ ACPI Configuration]**

➔ **Suspend mode [S1 (POS)]**

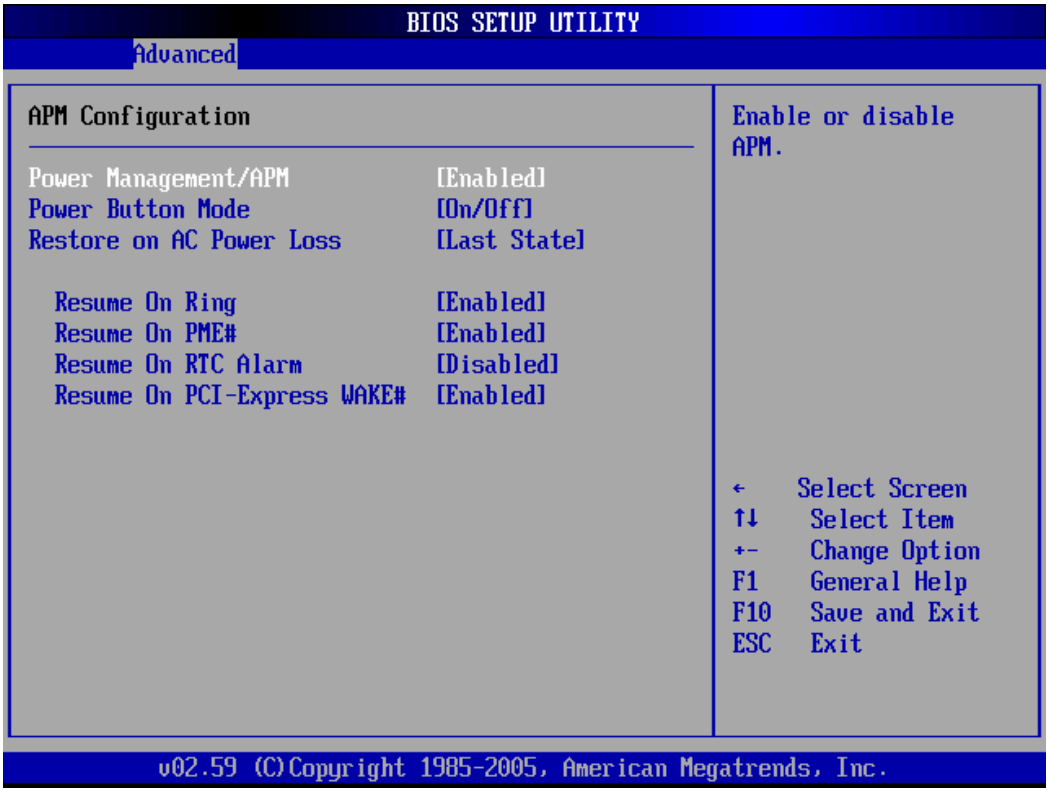
Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

### 5.3.6 APM Configuration

Use the **APM Configuration** menu (**BIOS Menu 10**) to select the advanced power management.




**BIOS Menu 10: APM Configuration**

➔ **Power Management/APM [Enabled]**

The **Power Management/APM** BIOS option accesses the advanced power management features.

➔ **Disabled** Disables the Advanced Power Management (APM) feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Power Button Mode [On/Off]**

The **Power Button Mode** BIOS specifies how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

- **Suspend** — When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

The Restore on AC Power Loss BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

- **Power Off** — The system remains turned off
- **Power On** — The system turns on
- **Last State** **DEFAULT** — The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume on Ring [Enabled]**

The **Resume on Ring** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system will be roused by an incoming call on a modem.

- **Disabled** — Wake event not generated by an incoming call
- **Enabled** **DEFAULT** — Wake event generated by an incoming call

➔ **Resume on PME# [Enabled]**

The **Resume on PME#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event) controller.

- **Disabled** — Wake event not generated by PCI PME controller activity
- **Enabled** **DEFAULT** — Wake event generated by PCI PME controller activity

➔ **Resume On RTC Alarm [Disabled]**

The **Resume On RTC Alarm** determines when the computer will be roused from a suspended state.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | The real time clock (RTC) cannot generate a wake event |
| ➔ **Enabled** | | If selected, the following will appear with values that can be selected:<br>➔ **RTC Alarm Date (Days)**<br>➔ **System Time**<br>After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off. |

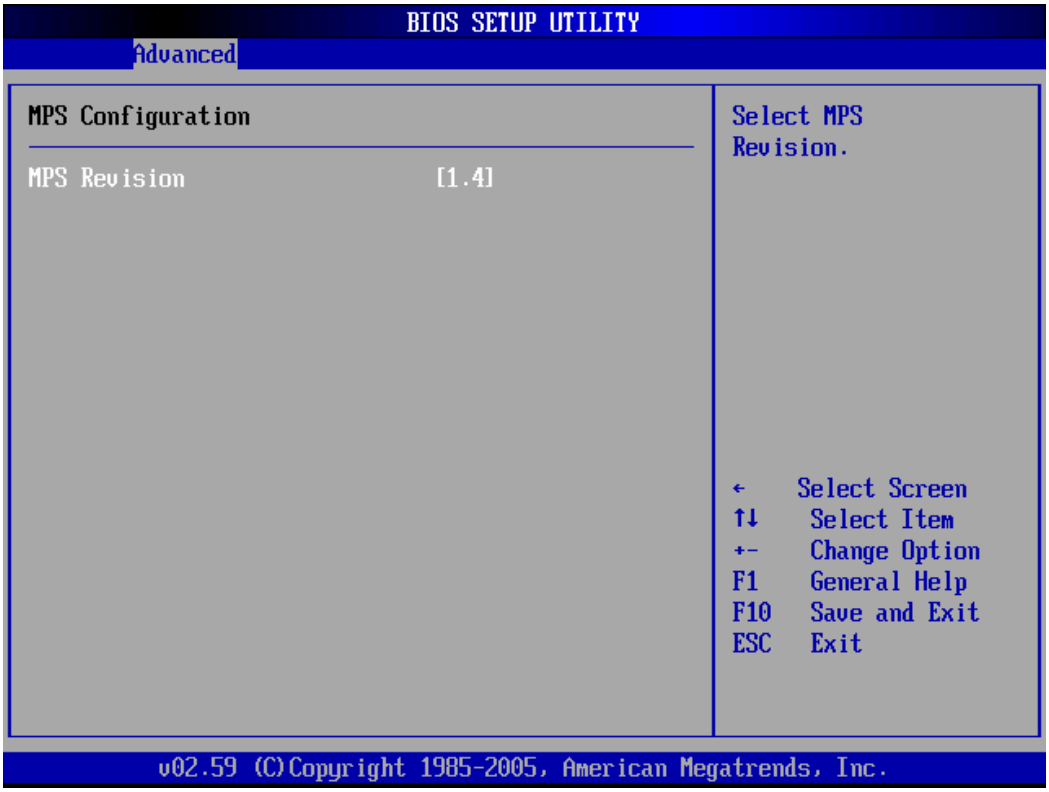
➔ **Resume On PCI-Express WAKE# [Enabled]**

The **Resume On PCI-Express WAKE#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI-Express controller.

| | | |
|---|---|---|
| ➔ **Enabled** | **DEFAULT** | Wake event generated by PCI-Express controller activity |
| ➔ **Disabled** | | Wake event not generated by PCI-Express controller activity |

### 5.3.7 MPS Configuration

Use the **MPS Configuration** menu (**BIOS Menu 11**) to select `he multi-processor table.




**BIOS Menu 11: MPS Configuration**

➔ **MPS Revision [1.4]**

Use the **Multiprocessor Specification (MPS) for OS** option to specify the MPS version to be used.

➔ **1.1** MPS version 1.1 is used

➔ **1.4 DEFAULT** MPS version 1.4 is used

### 5.3.8 Smbios Configuration

Use the **Smbios Configuration** menu (Error! Reference source not found.) to configure SMBIOS parameters.

**BIOS Menu 12: Smbios Configuration [Advanced]**

➔ **Smbios Smi Support [Enabled]**

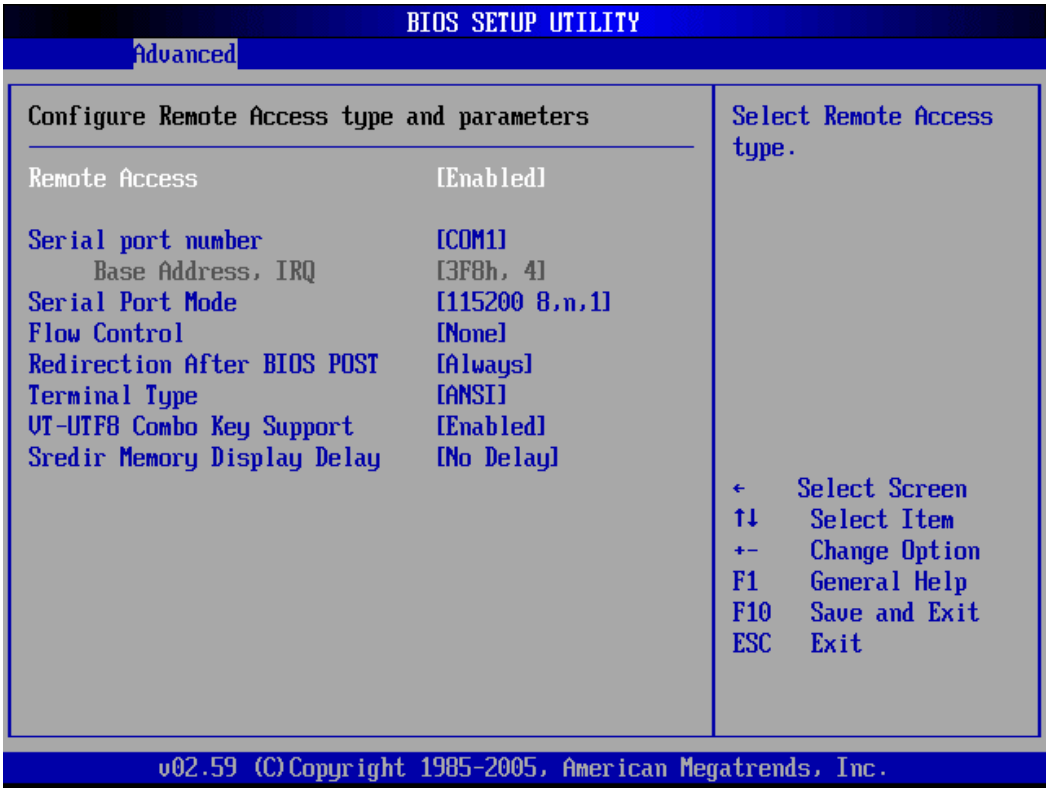
Use the **Smbios Smi Support** to enable the system to support the SMBIOS SMI wrapper for the PnP function 50h – 54h.

➔ **Disabled** SMBIOS SMI wrapper for the PnP function 50h – 54h not supported

➔ **Enabled** **DEFAULT** SMBIOS SMI wrapper for the PnP function 50h – 54h supported

### 5.3.9 Remote Access Configuration

Use the **Remote Access Configuration** menu (Error! Reference source not found.) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.




**BIOS Menu 13: Remote Access Configuration [Advanced]**

➔ **Remote Access [Enabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** Remote access is disabled.

➔ **Enabled** **DEFAULT** Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**
- ➔ **Redirection after BIOS POST**

➔ **Terminal Type**

➔ **VT-UTF8 Combo Key Support**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

| | | |
|---|---|---|
| ➔ **COM1** | **DEFAULT** | System is remotely accessed through COM1 |
| ➔ **COM2** | | System is remotely accessed through COM2 |
| ➔ **COM3** | | System is remotely accessed through COM3 |
| ➔ **COM4** | | System is remotely accessed through COM4 |
| ➔ **COM5** | | System is remotely accessed through COM5 |

**NOTE**: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h, 4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

**NOTE:**

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

| | | |
|---|---|---|
| ➔ **None** | **DEFAULT** | No control flow, |
| ➔ **Hardware** | | Hardware is set as the console redirection |
| ➔ **Software** | | Software is set as the console redirection |

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

| | | |
|---|---|---|
| ➔ **Disabled** | | The console is not redirected after POST |
| ➔ **Boot Loader** | | Redirection is active during POST and during Boot Loader |
| ➔ **Always** | **DEFAULT** | Redirection is always active (Some OSes may not work if set to Always) |

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

| | | |
|---|---|---|
| ➔ **ANSI** | **DEFAULT** | The target terminal type is ANSI |
| ➔ **VT100** | | The target terminal type is VT100 |
| ➔ **VT-UTF8** | | The target terminal type is VT-UTF8 |

➔ **VT-UTF8 Combo Key Support [Enabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled** Disables the VT-UTF8 terminal keys

➔ **Enabled** **DEFAULT** Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

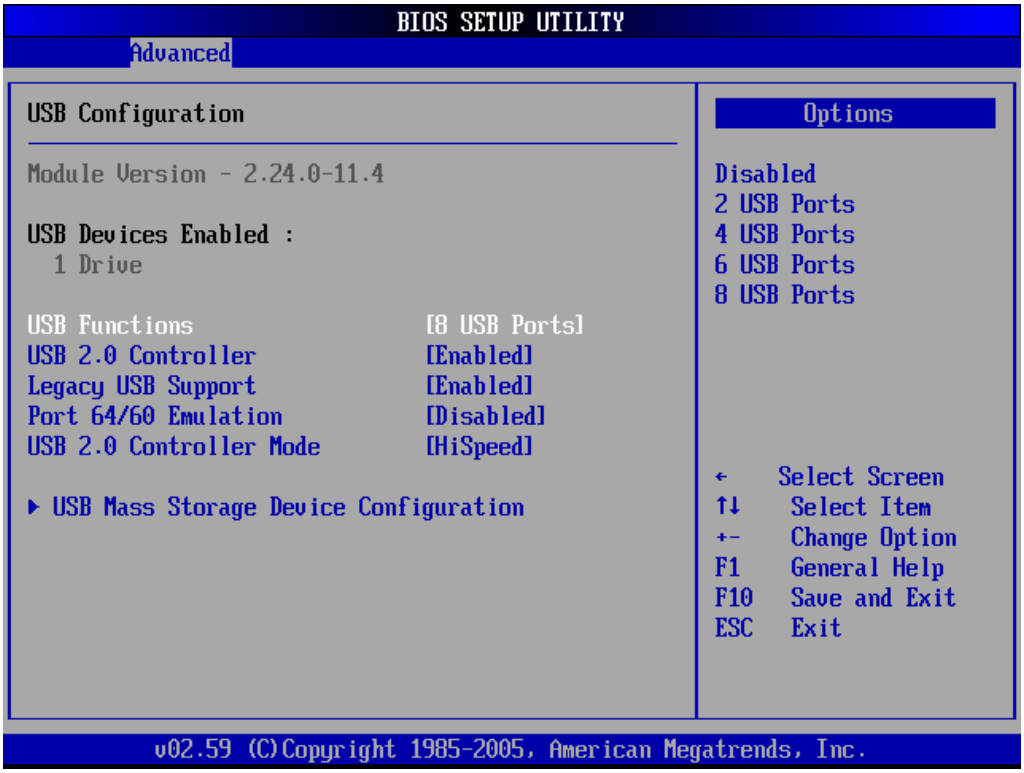
➔ **Sredir Memory Display Delay [No Delay]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay **DEFAULT**
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

### 5.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 14**) to read USB configuration information and configure the USB settings.




**BIOS Menu 14: USB Configuration**

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB Function [8 USB Ports]**

Use the **USB Function** BIOS option to disable USB function support or to set the number of USB ports to activate.

| | |
|---|---|
| ➔ **Disabled** | USB function support disabled |
| ➔ **2 USB Ports** | Two USB ports are activated. |
| ➔ **4 USB Ports** | Four USB ports are activated. |

- ➔ **6 USB Ports** Six USB ports are activated.
- ➔ **8 USB Ports** **DEFAULT** Eight USB ports are activated.

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

- ➔ **Enabled** **DEFAULT** USB 2.0 controller enabled
- ➔ **Disabled** USB 2.0 controller disabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

➔ **Port 64/60 Emulation [Disabled]**

Use the **Port 64/60 Emulation** option to enable or disable I/O port 60h/64h emulation support.

- ➔ **Disabled** **DEFAULT** I/O port 60h/64h emulation support disabled
- ➔ **Enabled** I/O port 60h/64h emulation support enabled

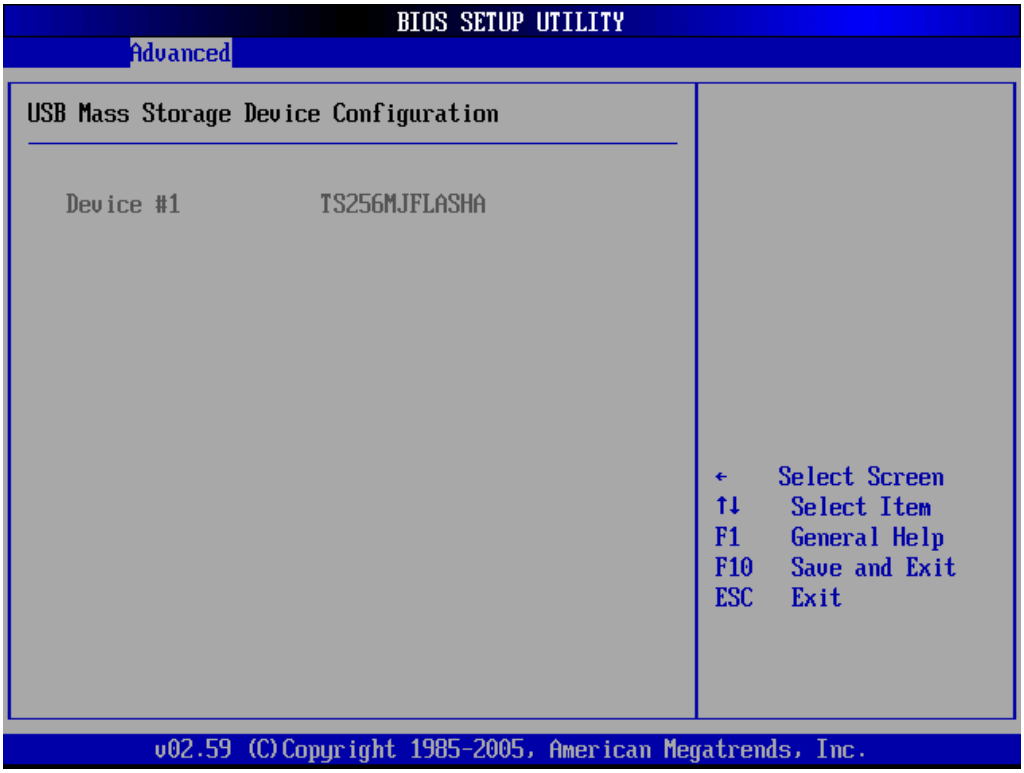
➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

| | | |
|---|---|---|
| ➔ **FullSpeed** | | The controller is capable of operating at 12Mb/s |
| ➔ **HiSpeed** | **DEFAULT** | The controller is capable of operating at 480Mb/s |

### 5.3.10.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (**BIOS Menu 14**) to configure USB mass storage class devices.



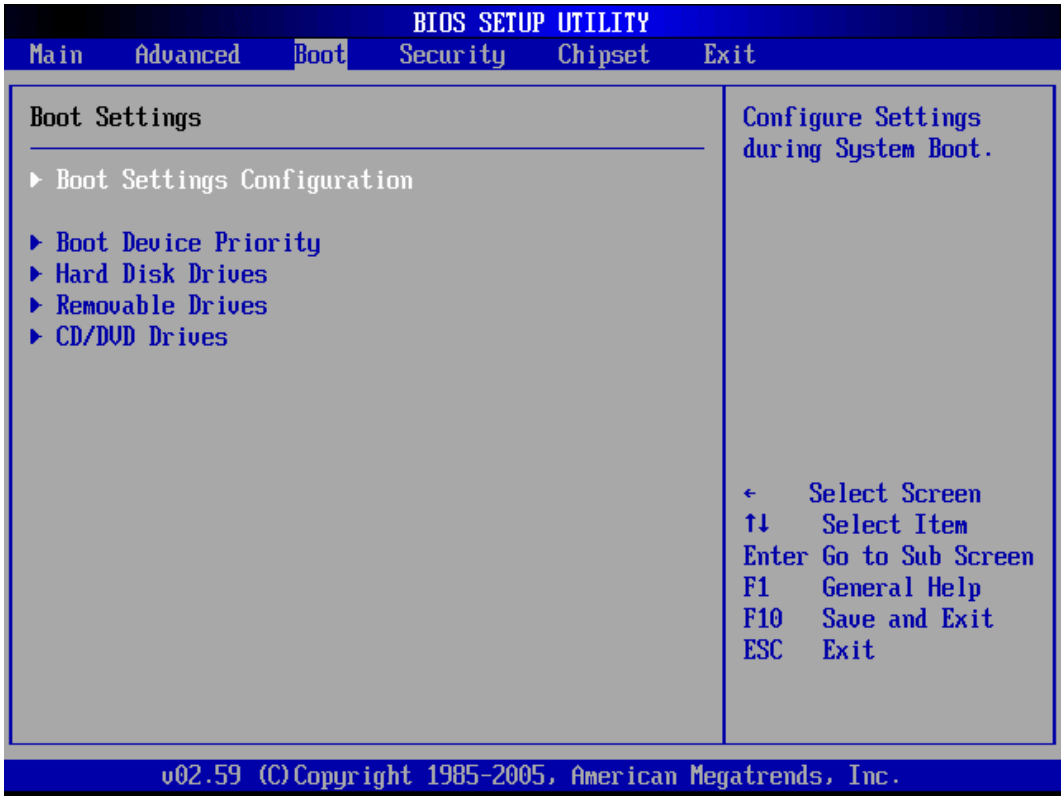

**BIOS Menu 15: USB Mass Storage Device Configuration**

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

## 5.4 Boot

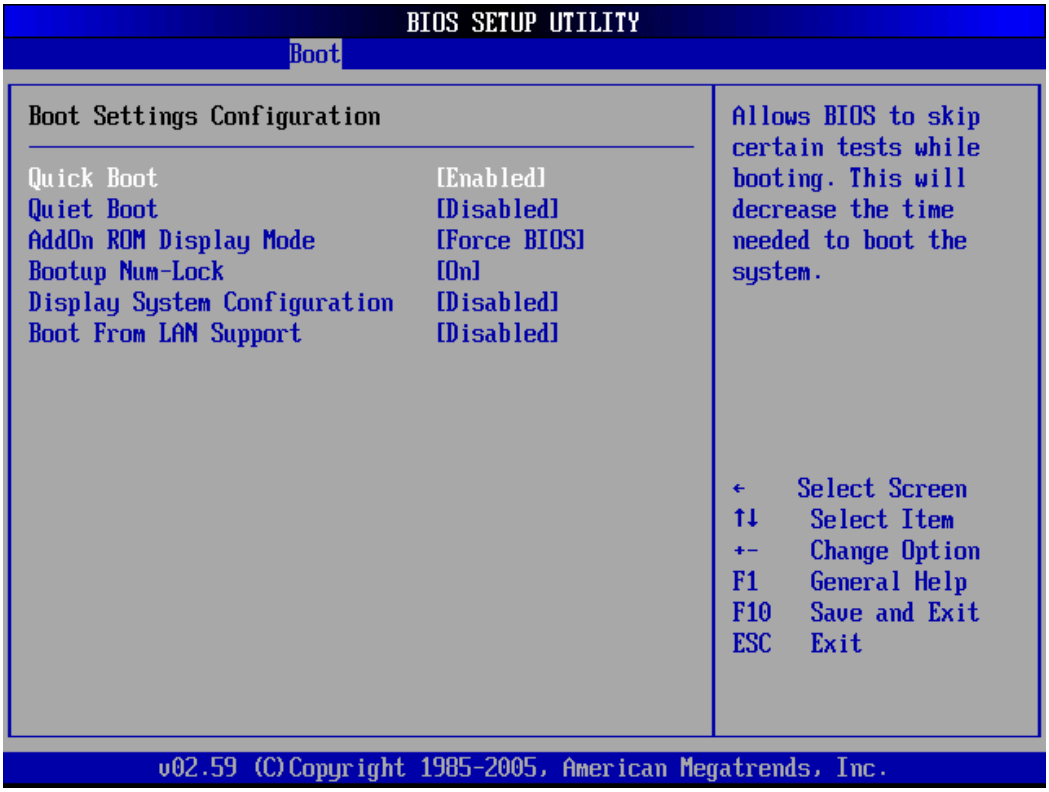
Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.




**BIOS Menu 16: Boot**

### 5.4.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 17**) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Display System Configuration [Disabled]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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**BIOS Menu 17: Boot Settings Configuration**

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

| | | |
|---|---|---|
| ➔ **Disabled** | | No POST procedures are skipped |
| ➔ **Enabled** | **DEFAULT** | Some POST procedures are skipped to decrease the system boot time |

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | Normal POST messages displayed |
| ➔ **Enabled** | | OEM Logo displayed instead of POST messages |

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

| | | |
|---|---|---|
| ➔ **Force BIOS** | **DEFAULT** | The system forces third party BIOS to display during system boot. |
| ➔ **Keep Current** | | The system displays normal information during system boot. |

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

| | | |
|---|---|---|
| ➔ **Off** | | Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged. |
| ➔ **On** | **DEFAULT** | Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit. |

➔ **Display System Configuration [Disabled]**

Use the **Display System Configuration** BIOS option to enable or disable the display system configuration.

| | | |
|---|---|---|
| ➔ **Enabled** | | The display system configuration is enabled |
| ➔ **Disabled** | **DEFAULT** | The display system configuration is disabled |

➔ **Boot From LAN Support [Disabled]**

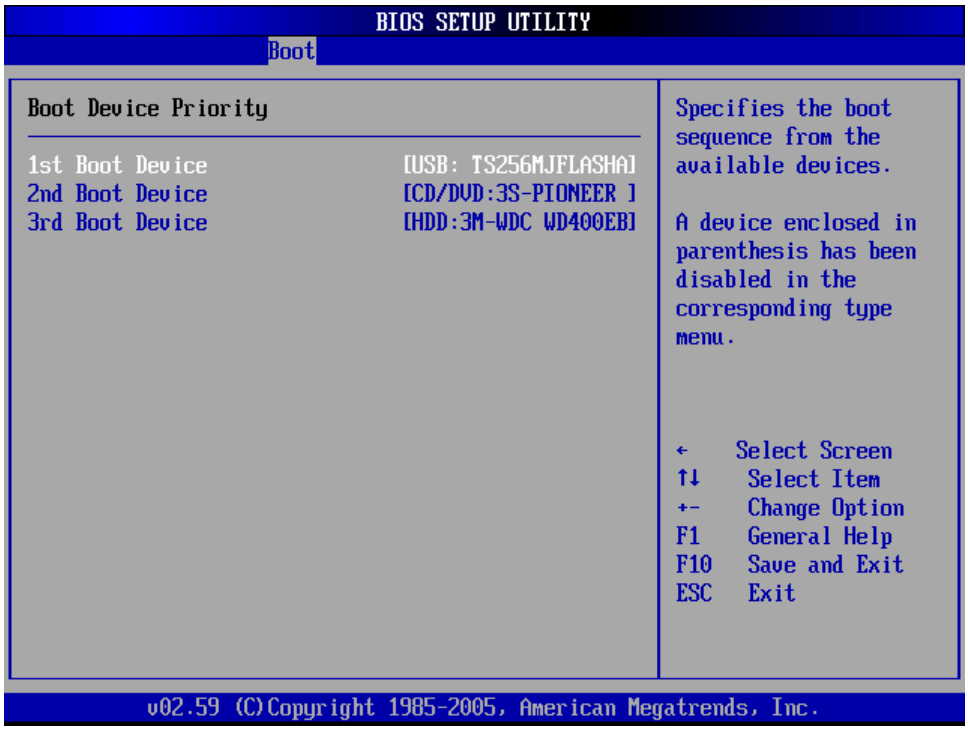
The **BOOT From LAN Support** option enables the system to be booted from a remote system.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | Cannot be booted from a remote system through the LAN |
| ➔ **Enabled** | | Can be booted from a remote system through the LAN |

### 5.4.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [USB: TS256MJFLASHA]
2nd Boot Device [CD/DVD:3S-PIONEER ]
3rd Boot Device [HDD:3M-WDC WD400EB]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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**BIOS Menu 18: Boot Device Priority Settings**

### 5.4.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive [HDD: PM-(part number)]

---

**NOTE:**

Only the drives connected to the system are shown. For example, if only two HDDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

---

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available HDDs is shown. Select the first HDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

### 5.4.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 19**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

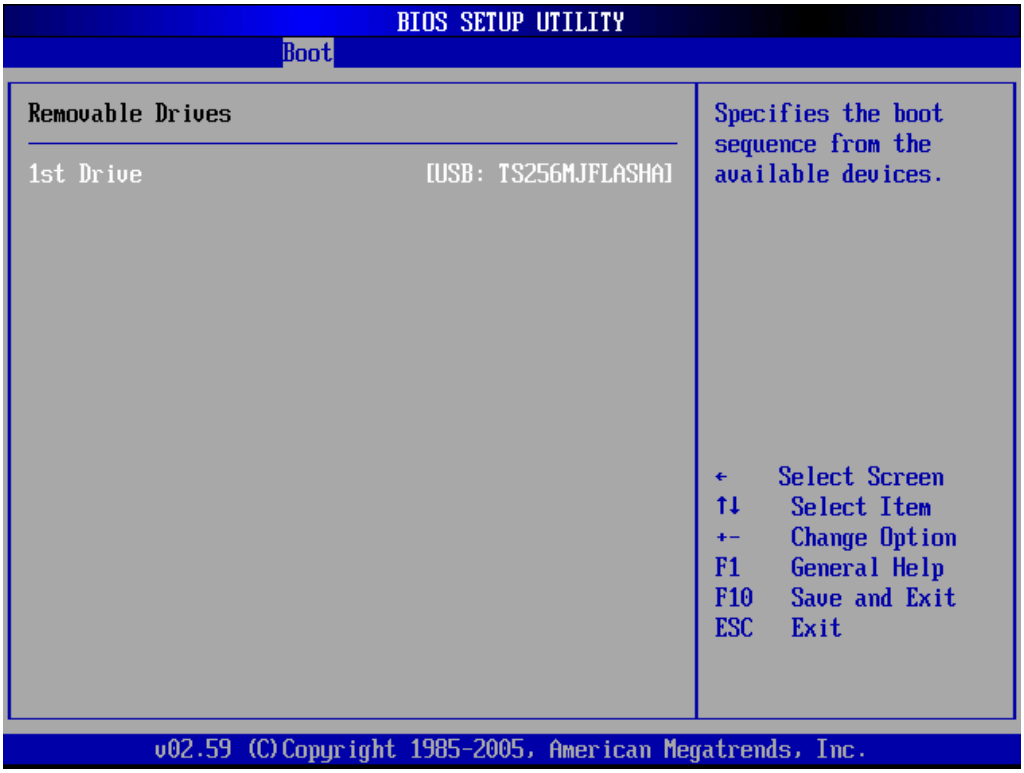
---

**NOTE:**

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

---

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.




**BIOS Menu 19: Removable Drives**

### 5.4.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]

**NOTE:**

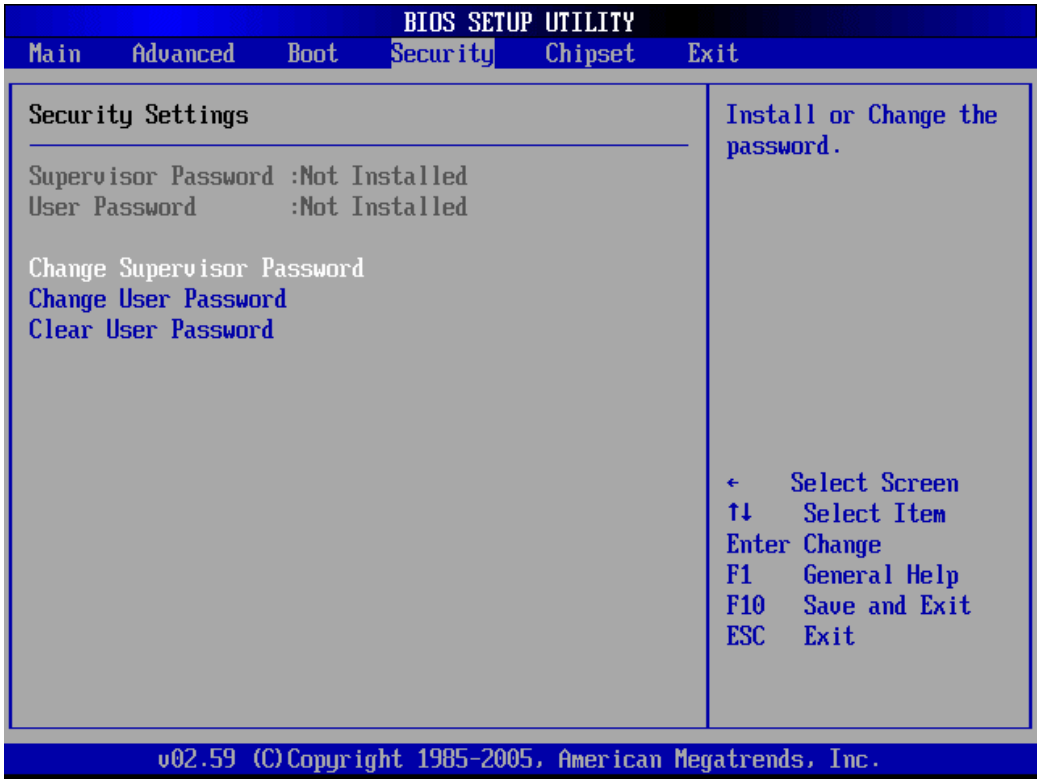
Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only "**1st Drive**" and "**2nd Drive**" are

listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

## 5.5 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.




**BIOS Menu 20: Security**

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

## 5.6 Chipset

Use the **Chipset** menu (**BIOS Menu 21**) to access the NorthBridge and SouthBridge configuration menus

**WARNING!**

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections
may cause system to malfunction.
▶ North Bridge Configuration
Onboard LAN1 : [Enabled]
Onboard LAN2 : [Enabled]
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

**BIOS Menu 21: Chipset**

➔ **OnBoard LAN1 [Enabled]**

The **OnBoard LAN1** option enables or disables the onboard LAN1.

| | | |
|---|---|---|
| ➔ **Disabled** | | Onboard LAN1 device manually disabled |
| ➔ **Enabled** | **DEFAULT** | The onboard LAN1 device automatically detected and enabled |

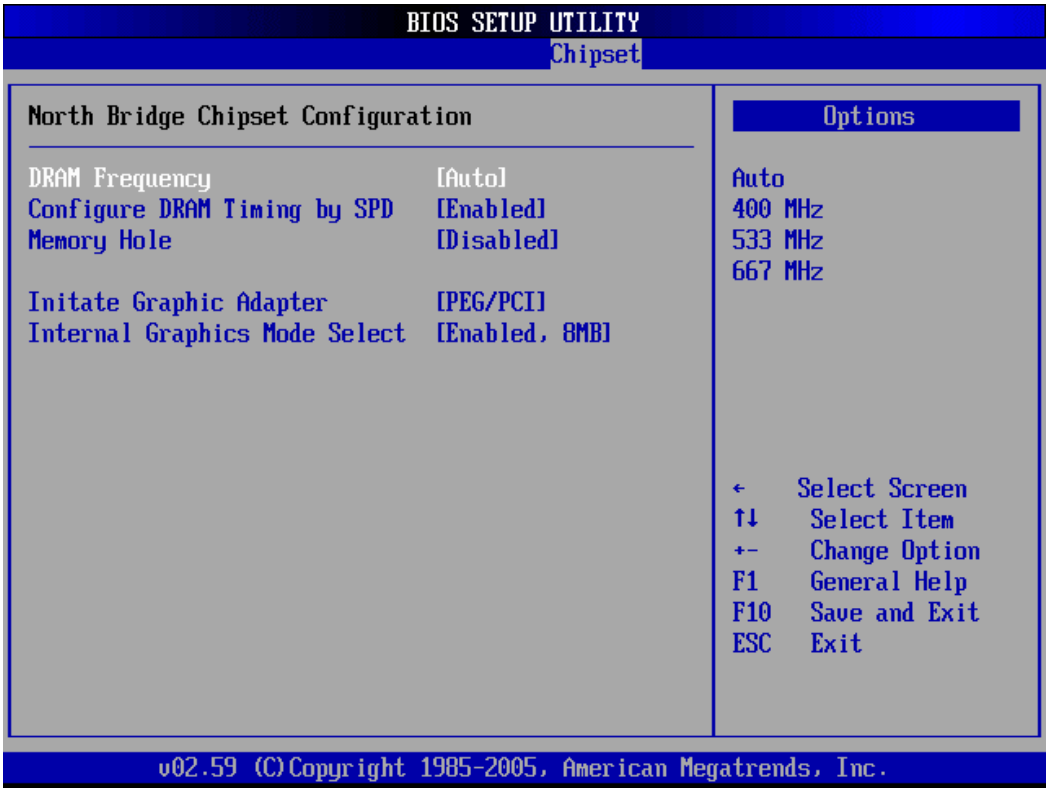
➔ **OnBoard LAN2 [Enabled]**

The **OnBoard LAN2** option enables or disables the onboard LAN1.

| | | |
|---|---|---|
| ➔ **Disabled** | | Onboard LAN2 device manually disabled |
| ➔ **Enabled** | **DEFAULT** | The onboard LAN2 device automatically detected and enabled |

### 5.6.1 North Bridge Configuration

Use the **NorthBridge Configuration** menu (**BIOS Menu 22**) to configure the northbridge chipset.




**BIOS Menu 22:NorthBridge Chipset Configuration**

➔ **DRAM Frequency [Auto]**

Use the **DRAM Frequency** option to specify the DRAM frequency or allow the system to automatically detect the DRAM frequency.

| | | | |
|---|---|---|---|
| ➔ | **Auto** | **DEFAULT** | Automatically selects the DRAM frequency |
| ➔ | **400MHz** | | Sets the DRAM frequency to 400MHz |
| ➔ | **533MHz** | | Sets the DRAM frequency to 533MHz |
| ➔ | **667MHz** | | Sets the DRAM frequency to 667MHz |

➔ **Configure DRAM Timing by SPD [Enabled]**

Use the **Configure DRAM Timing by SPD** option to determine if the system uses the SPD *(*Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications including the speed of the individual

components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | | DRAM timing parameters are manually set using the DRAM sub-items |
| ➔ | **Enabled** | **DEFAULT** | DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD) |

If the **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [3]
- DRAM RAS# to CAS# Delay [5 DRAM Clocks]
- DRAM RAS# Precharge [5 DRAM Clocks]
- DRAM RAS# Activate to Precha [15 DRAM Clocks]

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | **DEFAULT** | Memory is not reserved for ISA expansion cards |
| ➔ | **15MB – 16MB** | | Between 15MB and 16MB of memory is reserved for ISA expansion cards |

➔ **Initate Graphic Adapter [PEG/PCI]**

Use the **Initate Graphics Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD
- PCI/PEG
- PEG/IGD
- PEG/PCI **DEFAULT**

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

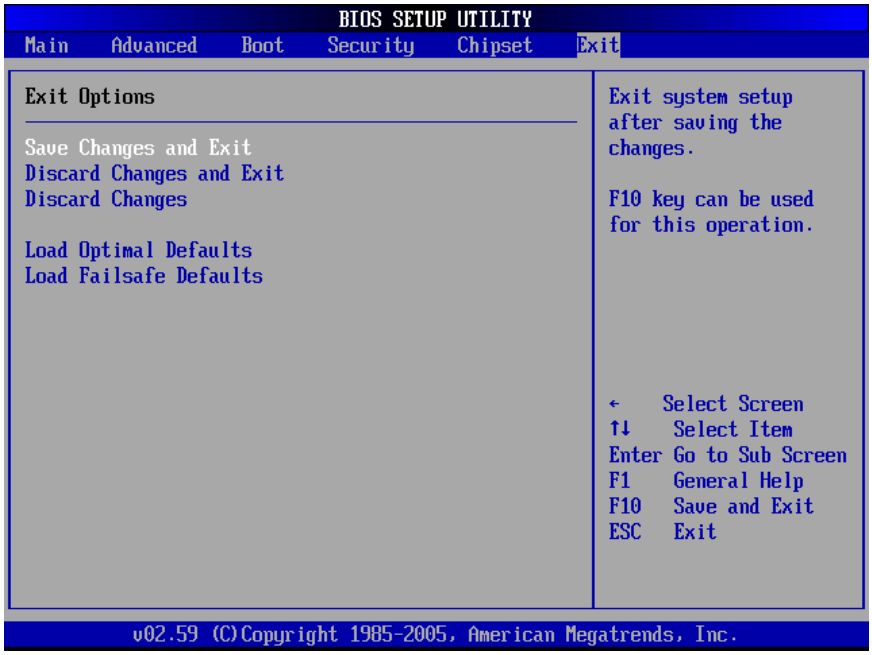
➔ **Disable**

➔ **Enable, 1MB** 1MB of memory used by internal graphics device

➔ **Enable, 8MB** **DEFAULT** 8MB of memory used by internal graphics device

## 5.7 Exit

Use the **Exit** menu (**BIOS Menu 23**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

**BIOS Menu 23:Exit**

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

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Chapter

6

# Software Drivers

## 6.1 Available Software Drivers

**NOTE:**

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The KINO-9454 motherboard has the following software drivers:

- Intel Chipset Driver Installation
- VGA Utilities Driver
- LAN Driver (for GbE LAN) Installation
- RealTek Audio Driver (ALC655) Installation
- SATA Driver Installation

All drivers can be found on the CD that came with the motherboard. To install the drivers please follow the instructions in the sections below.

## 6.2 Chipset Driver Installation

To install the chipset driver, please follow the steps below:

**Step 1:** Insert the CD into the system that contains the KINO-9454 board. Open the **1-INF** directory and locate the icon for the **infinst_autol.exe** installation file. Once located, use the mouse to double click the icon.

**Step 2:** The “InstallShield Wizard Preparation Screen” in **Figure 6-1** appears.

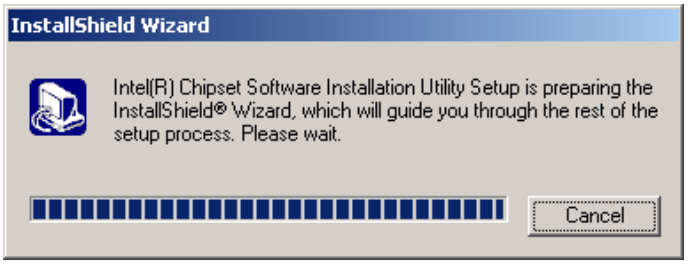
InstallShield Wizard
Intel(R) Chipset Software Installation Utility Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

**Figure 6-1: InstallShield Wizard Preparation Screen**

**Step 3:** The “Welcome” window in **Figure 6-2** appears next.

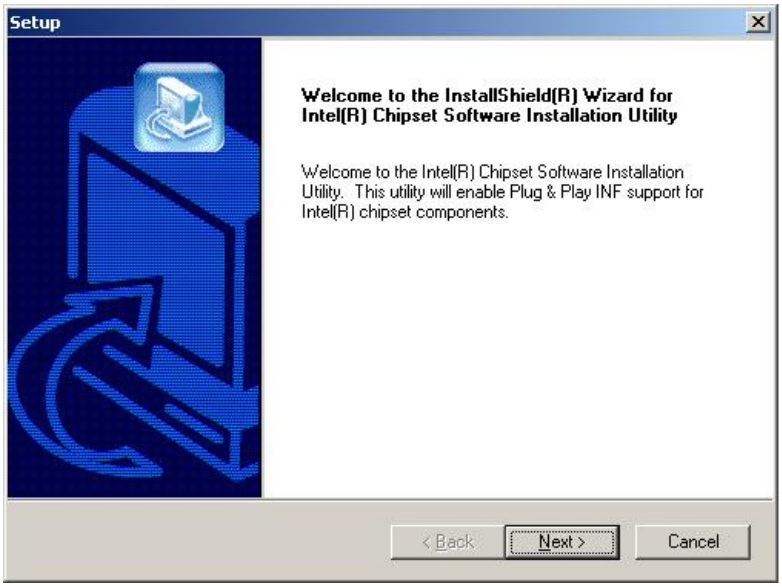
Setup
Welcome to the InstallShield(R) Wizard for Intel(R) Chipset Software Installation Utility
Welcome to the Intel(R) Chipset Software Installation Utility. This utility will enable Plug & Play INF support for Intel(R) chipset components.
< Back
Next >
Cancel

**Figure 6-2: Welcome Screen**

**Step 4:** Click “**NEXT**” and the license agreement shown in **Figure 6-3** appears.

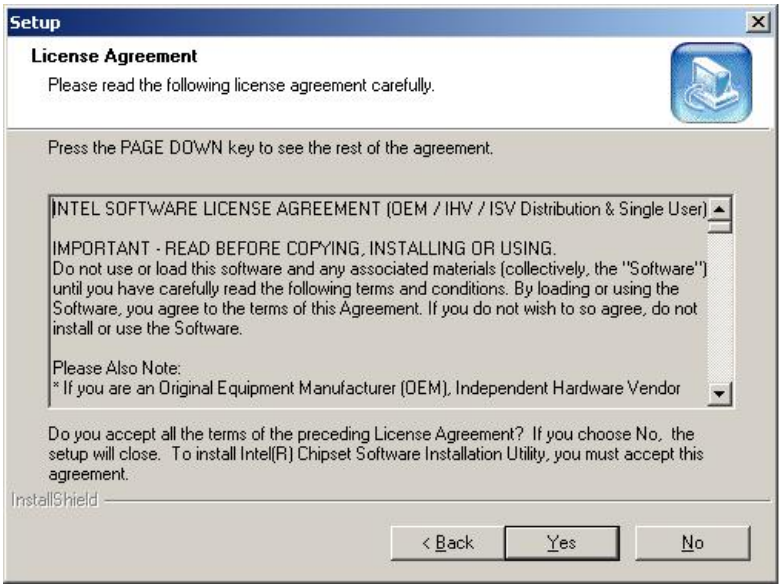
Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel(R) Chipset Software Installation Utility, you must accept this agreement.
InstallShield
< Back
Yes
No

**Figure 6-3: License Agreement**

**Step 5:** Agree to the license terms by clicking "**YES**". The "**Readme**" in **Figure 6-4** appears.

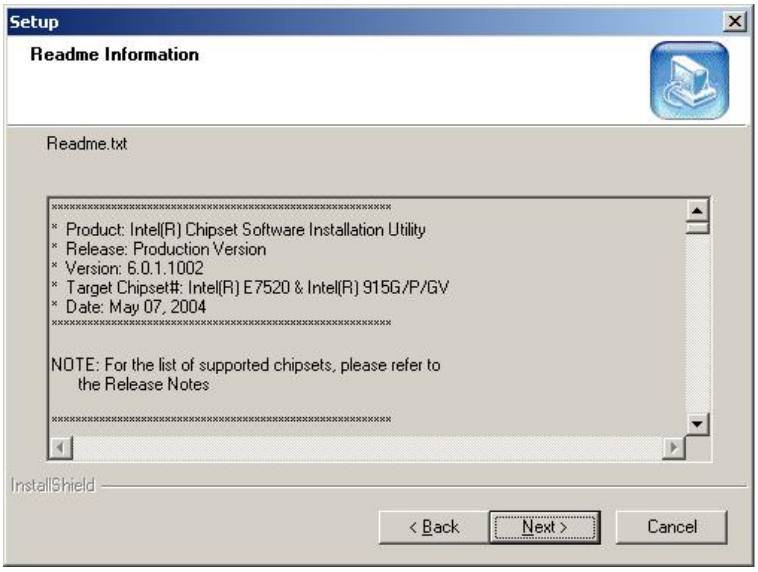
Setup
Readme Information
Readme.txt
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production Version
* Version: 6.0.1.1002
* Target Chipset#: Intel(R) E7520 & Intel(R) 915G/P/GV
* Date: May 07, 2004
NOTE: For the list of supported chipsets, please refer to the Release Notes
InstallShield
< Back
Next >
Cancel

**Figure 6-4: Readme Information**

**Step 6:** Click "**YES**". The driver is installed on the computer. After the installation is complete, the installation complete screen shown in **Figure 6-5** appears. Select the preferred option and click "**FINISH**" to complete the installation process.

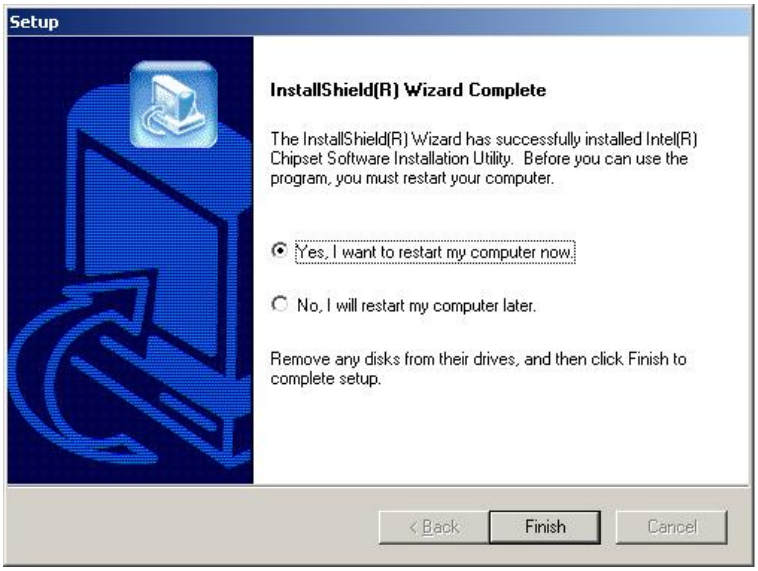
Setup
InstallShield(R) Wizard Complete
The InstallShield(R) Wizard has successfully installed Intel(R) Chipset Software Installation Utility. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

**Figure 6-5: Restart the Computer**

## 6.3 VGA Driver

To install the VGA driver, please follow the steps below:

**Step 1:** Insert the Utility CD that came with the motherboard into the system CD drive.

**Step 2:** Open the **X:\2-VGA\WIN2K_XP** directory (where **X:** is the system CD drive) and double-click the **win2k_xp1420.exe** installation file.

**Step 3:** The Starting Install Shield Wizard appears (**Figure 6-6**).

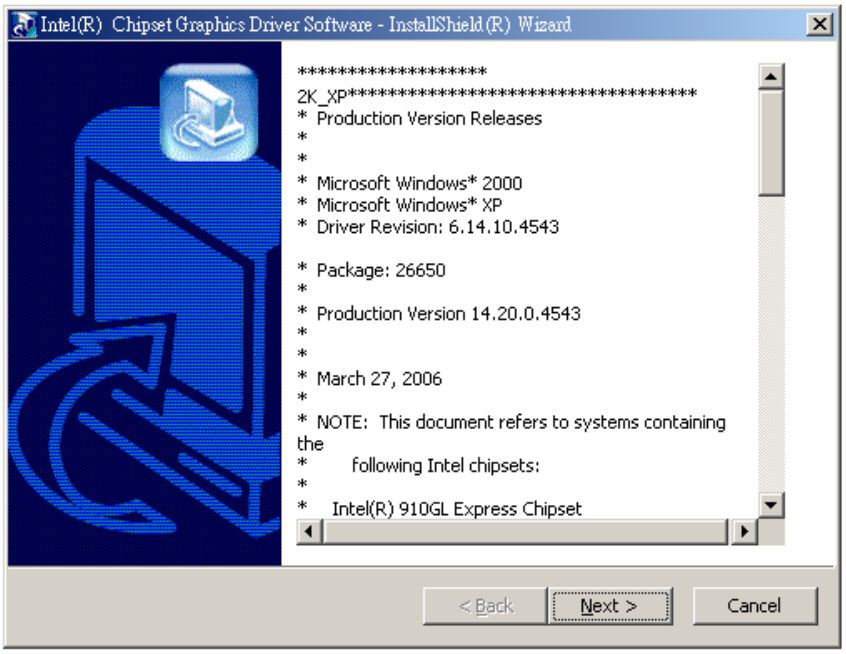


**Figure 6-6: Starting Install Shield Wizard Screen**

**Step 4:** The Preparing Setup window appears next (**Figure 6-7**).

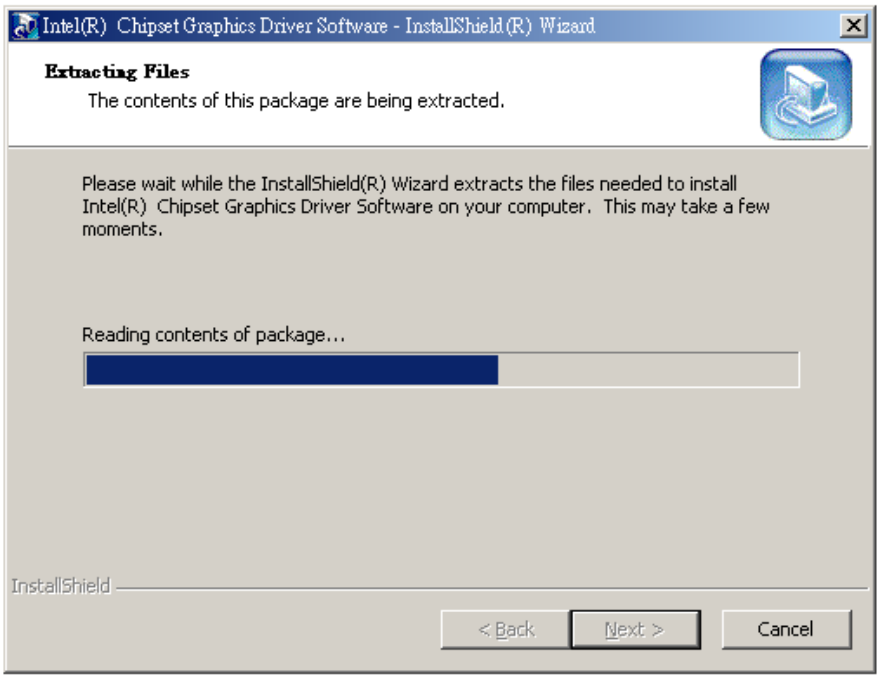
Intel(R) Chipset Graphics Driver Software - InstallShield (R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

**Figure 6-7: Preparing Setup Screen**

**Step 5:** A Welcome screen shown in **Figure 6-8** appears. Click **NEXT** to continue the

installation.

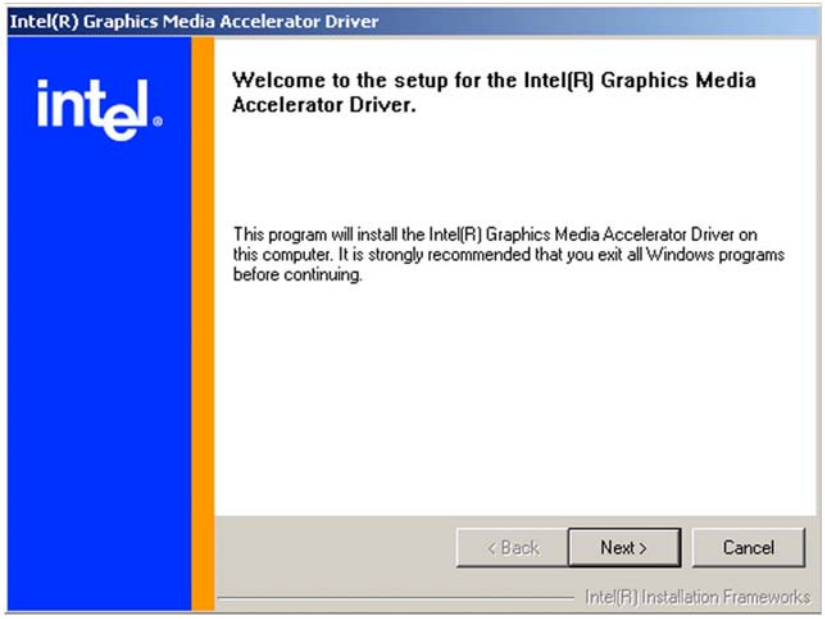
Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

**Figure 6-8: VGA Driver Installation Welcome Screen**

**Step 6:** A license agreement shown in **Figure 6-9** appears. Read through the license agreement.

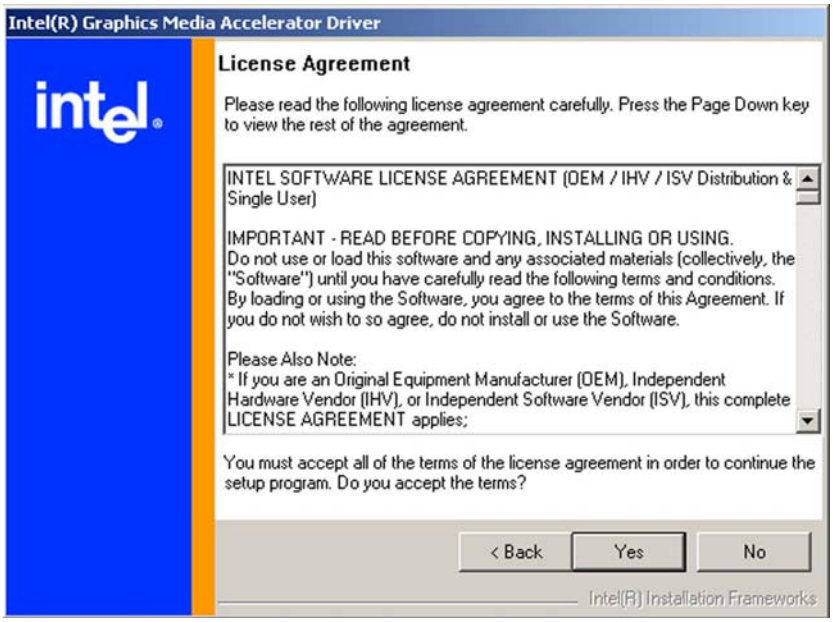
Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

**Figure 6-9: VGA Driver License Agreement**

**Step 7:** Accept the terms and conditions stipulated in the license agreement by clicking

the "**YES**" button (**Figure 6-9**). The installation notice shown in **Figure 6-10** appears.

**Figure 6-10: VGA Driver Installing Notice**

**Step 8:** After the driver installation process is complete, a confirmation screen shown in **Figure 6-11** appears.

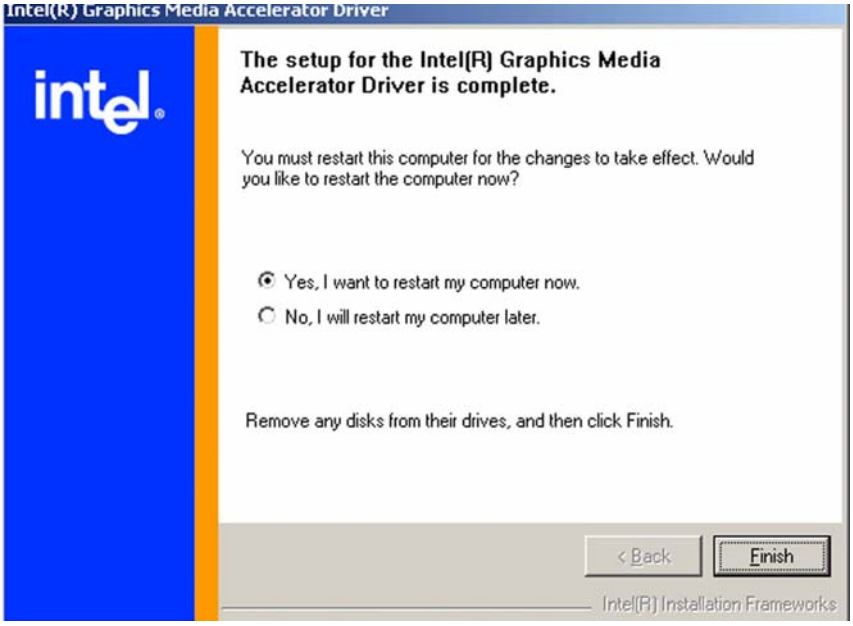
Intel(R) Graphics Media Accelerator Driver
intel
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish
Intel(R) Installation Frameworks

**Figure 6-11: VGA Driver Installation Complete**

**Step 9:** The confirmation screen shown in **Figure 6-11** allows user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided when to restart the computer, click the "**FINISH**" button.

## 6.4 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

**Step 1:** Open **Windows Control Panel (Figure 6-12**).

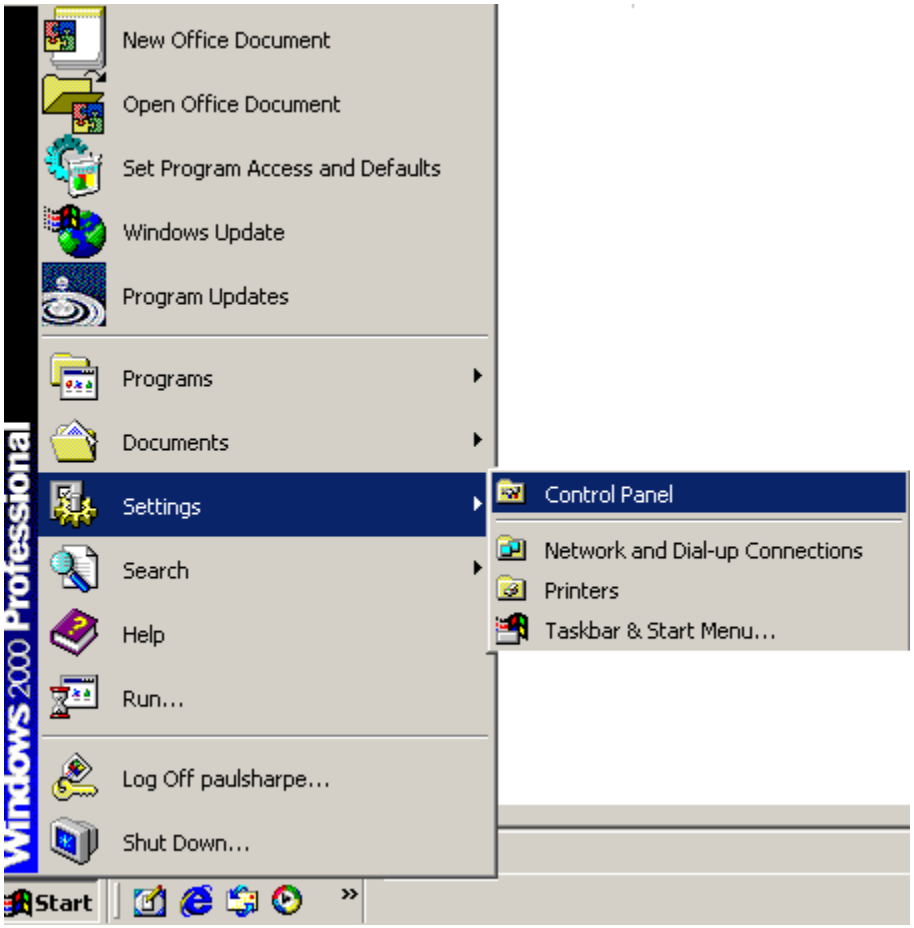


**Figure 6-12: Access Windows Control Panel**

**Step 2:** Double click the **System** icon (**Figure 6-13**).

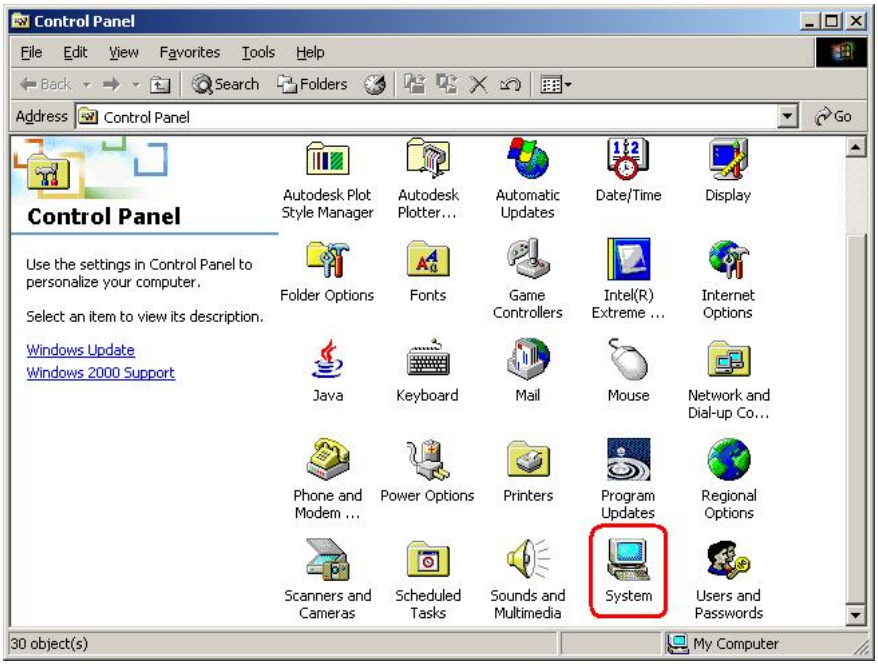


**Figure 6-13: Double Click the System Icon**

**Step 3:** Double click the **Device Manager** tab (**Figure 6-14**).

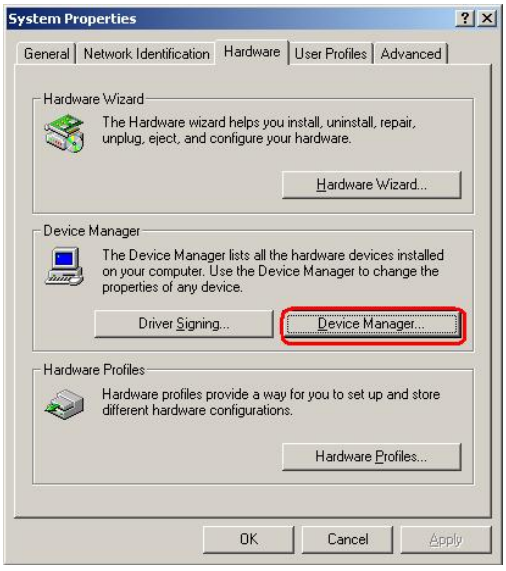
System Properties
General Network Identification Hardware User Profiles Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

**Figure 6-14: Double Click the Device Manager Tab**

**Step 4:** A list of system hardware devices appears (**Figure 6-15**).

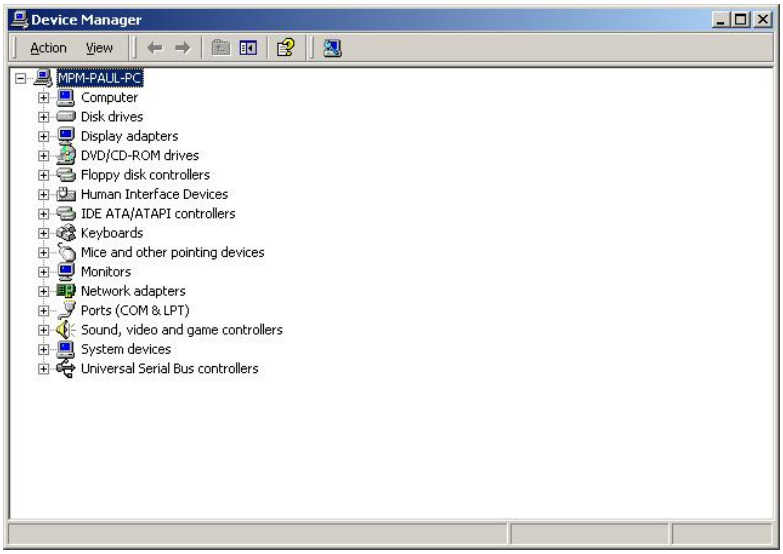


**Figure 6-15: Device Manager List**

**Step 5:** Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

**Step 6:** The **Device Driver Wizard** appears (**Figure 6-16**). Click **NEXT** to continue.

Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
532DD36TA0379HannStar U171
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

**Figure 6-16: Search for Suitable Driver**

**Step 7:** Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 6-17**). Click **NEXT** to continue.

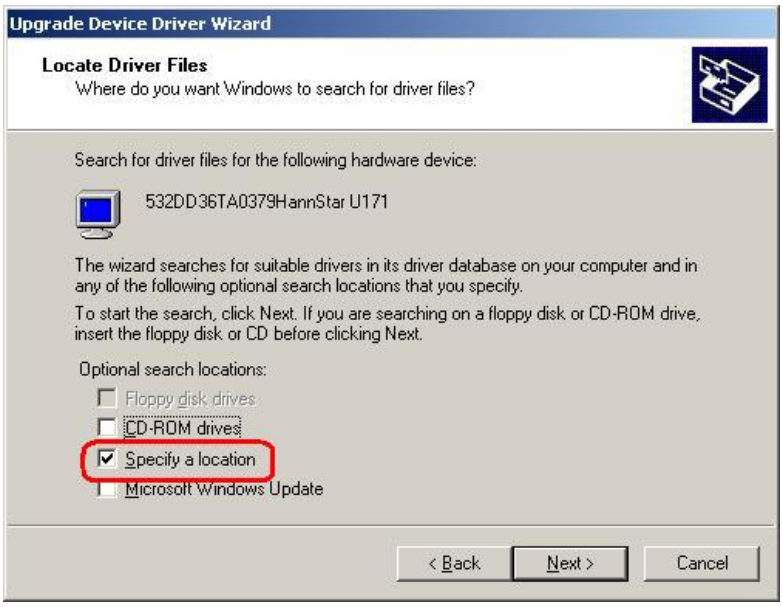
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
532DD36TA0379HannStar U171
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

**Figure 6-17: Locate Driver Files**

**Step 8:** Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory (**Figure 6-18**) in the location browsing window, where "**X:\"** is the system CD drive.

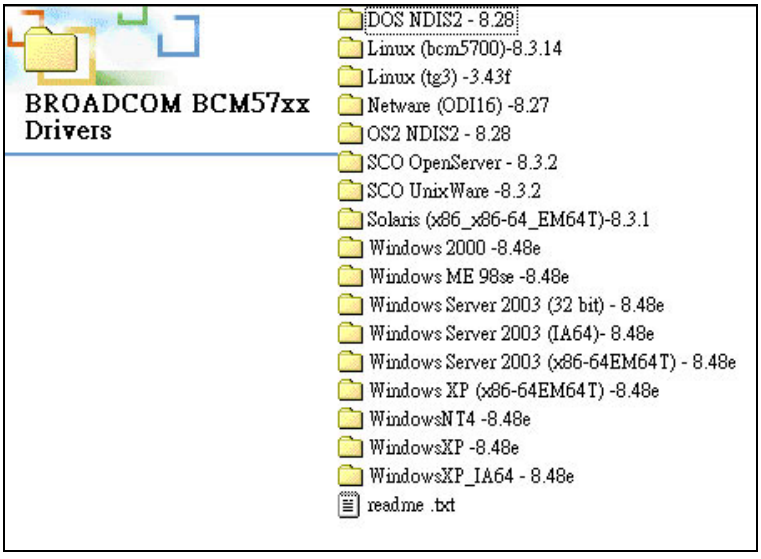


**Figure 6-18: Location Browsing Window**

**Step 9:** Click **OK** to continue. A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

## 6.5 RealTek Audio Driver (ALC655) Installation

To install the Realtek Audio driver, please follow the steps below.

**Step 1:** Insert the Utility CD that came with the motherboard into the system CD drive. Open the **X:\4-Audio\AC-KIT08R\AIc655** directory (where **X:** is the system CD drive) and double-click the **Setup.exe** installation file to begin extracting files (**Figure 6-19**).

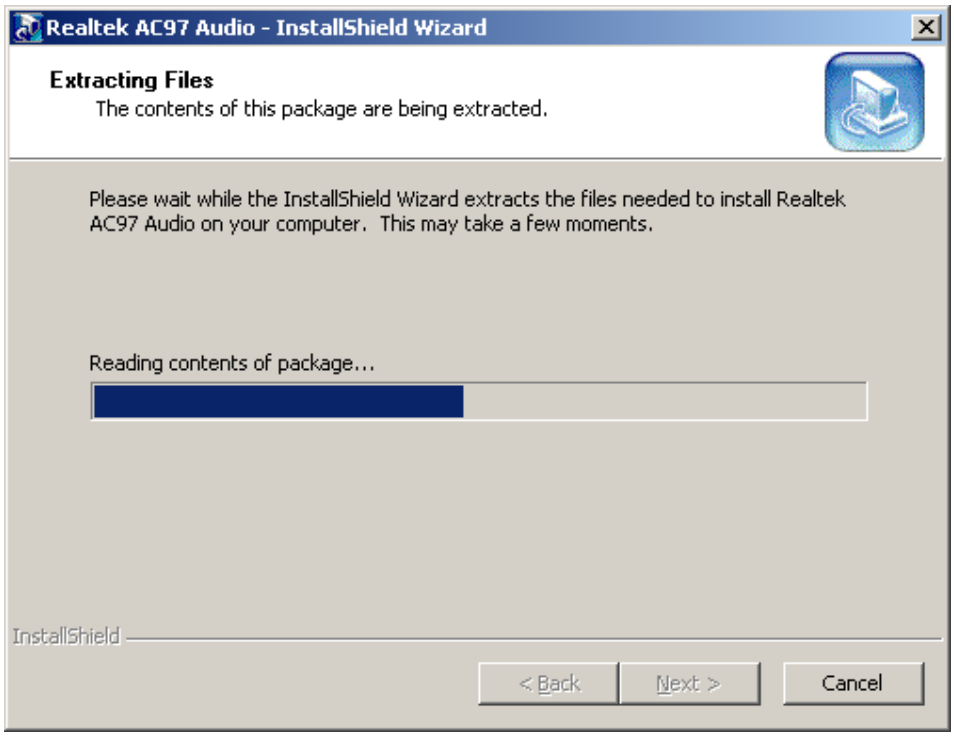
Realtek AC97 Audio - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install Realtek AC97 Audio on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

**Figure 6-19: InstallShield Wizard Extracting Files**

**Step 2:** The Realtek AC'97 Audio Setup prepares the InstallShield Wizard (**Figure 6-20**).

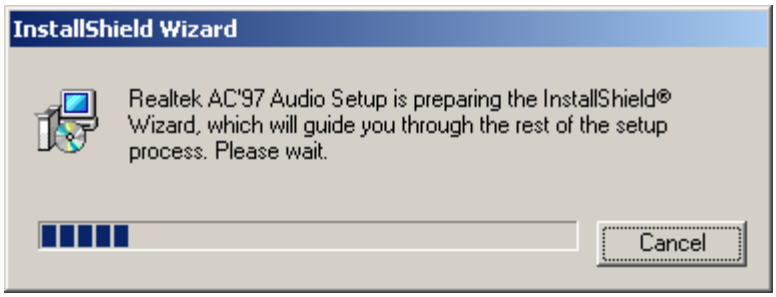
InstallShield Wizard
Realtek AC'97 Audio Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

**Figure 6-20: Audio Driver Install Shield Wizard Starting**

**Step 3:** The Setup Status screen appears as the driver is installed (**Figure 6-21**).

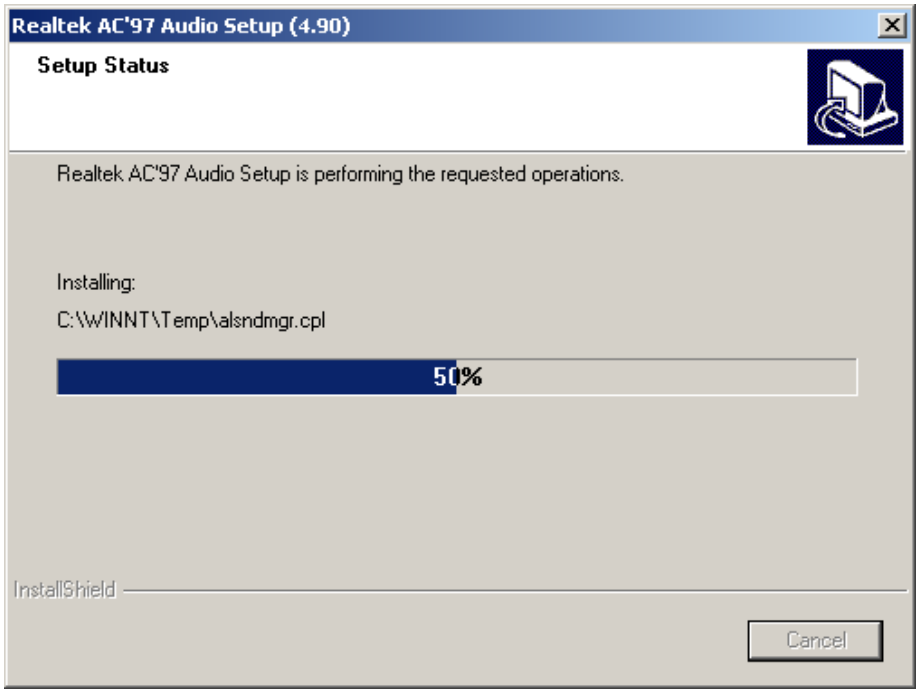


**Figure 6-21: Audio Driver Setup Preparation**

**Step 4:** At this stage the Digital Signal Not Found screen appears (**Figure 6-22**). Click **YES** to continue.

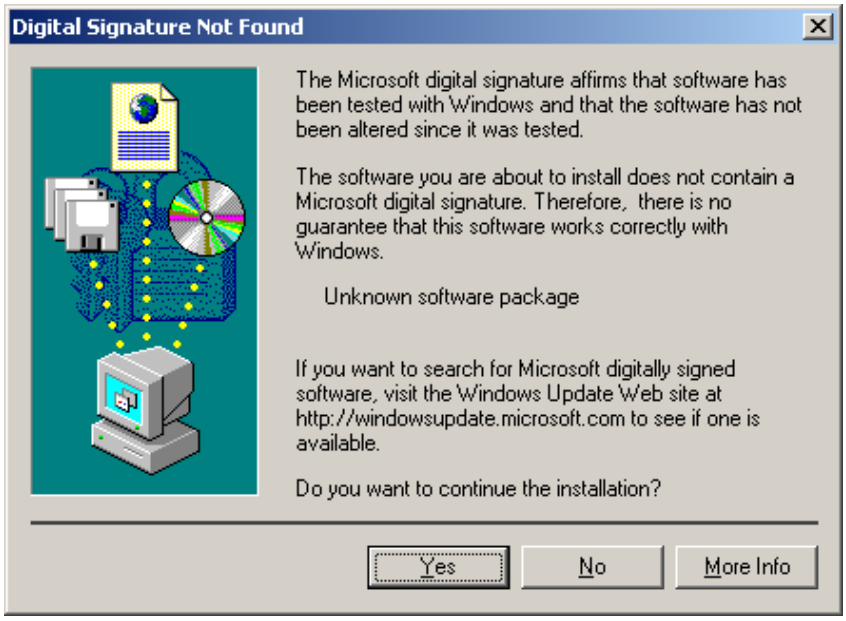
Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Unknown software package
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

**Figure 6-22: Audio Driver Digital Signal**

**Step 5:** The audio driver installation continues (**Figure 6-23**).

**Figure 6-23: Audio Driver Installation Continues**

**Step 6:** After the driver installation process is complete, a confirmation screen appears (**Figure 6-24**).

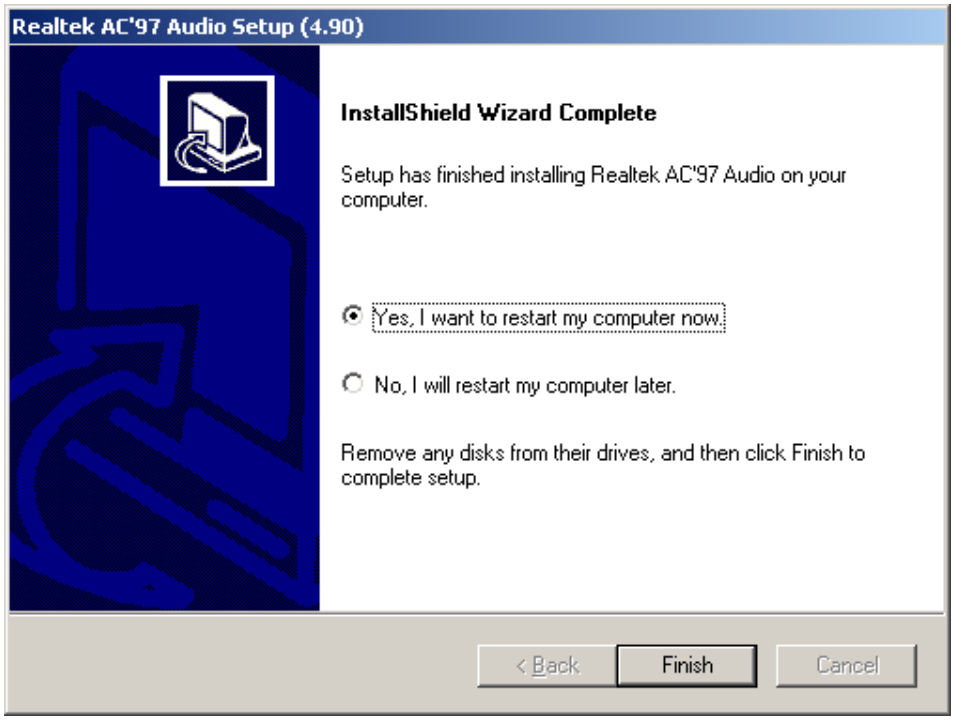
Realtek AC'97 Audio Setup (4.90)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

**Figure 6-24: Audio Driver Installation Complete**

**Step 7:** The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

## 6.6 Intel Matrix Storage Manager Installation

To install the Intel Matrix Storage Manager driver, please follow the steps below:

**Step 1:** Insert the Utility CD that came with the motherboard into the system CD drive.

**Step 2:** Open the **X:\5-SATA\ICH7R** directory and double-click the **iata60_cd.exe** installation file.

**Step 3:** The Preparing Setup window appears (**Figure 6-25**).

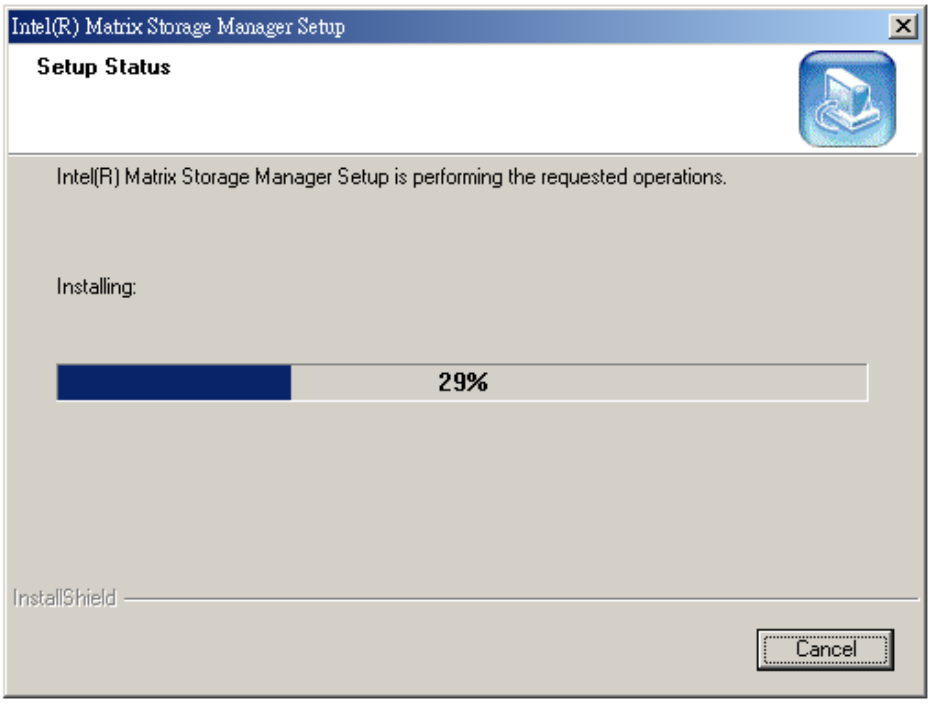


**Figure 6-25: Preparing Setup Screen**

**Step 4:** A Welcome screen appears. Click **NEXT** to continue the installation.

**Step 5:** A license agreement appears. Read through the license agreement.

**Step 6:** The "Uninstallation Warning" window appears. Click on the **NEXT** button to continue.

**Step 7:** Accept the terms and conditions stipulated in the license agreement by clicking the "**YES**" button.

**Step 8:** The "Choose Destination Location" window appears. Click on the **NEXT** button to continue. By default, all installed files are copied to the following path: **<bootdrive>:\Program Files\Intel\Intel(R) Matrix Storage Manager**.

**Step 9:** The "Select Program Folder" window appears. Click on the **NEXT** button to continue installing the driver.

**Step 10:** After the driver installation process is complete, a confirmation screen appears.

**Step 11:** The confirmation screen allows user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to

take effect the computer must be restarted. Once decided when to restart the computer, click the “**FINISH**” button.

Appendix

A

# BIOS Configuration Options

## A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

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Appendix

B

# Watchdog Timer

**NOTE:**

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

**INT 15H:**

| **AH – 6FH Sub-function:** | |
|---|---|
| AL – 2: | Sets the Watchdog Timer's period. |
| BL: | Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup). |

**Table B-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

## Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

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Appendix

C

# Address Mapping

## C.1 IO Address Map

| I/O address Range | Description |
|---|---|
| 000-01F | DMA Controller |
| 020-021 | Interrupt Controller |
| 040-043 | System time |
| 060-06F | Keyboard Controller |
| 070-07F | System CMOS/Real time Clock |
| 080-09F | DMA Controller |
| 0A0-0A1 | Interrupt Controller |
| 0C0-0DF | DMA Controller |
| 0F0-0FF | Numeric data processor |
| 1F0-1F7 | Primary IDE Channel |
| 2E0-2E7 | Serial Port 5 (COM5) |
| 2E8-2EF | Serial Port 4 (COM4) |
| 2F8-2FF | Serial Port 2 (COM2) |
| 378-37F | Parallel Printer Port 1 (LPT1) |
| 3B0-3BB | Intel 945G Graphics Controller |
| 3C0-3DF | Intel 945G Graphics Controller |
| 3E8-3EF | Serial Port 3 (COM3) |
| 3F6-3F6 | Primary IDE Channel |
| 3F7-3F7 | Standard floppy disk controller |
| 3F8-3FF | Serial Port 1 (COM1) |

**Table C-1: IO Address Map**

## C.2 1st MB Memory Address Map

| Memory address | Description |
|---|---|
| 00000-9FFFF | System memory |
| A0000-BFFFF | VGA buffer |
| F0000-FFFFF | System BIOS |
| 1000000- | Extend BIOS |

**Table C-2: 1st MB Memory Address Map**

## C.3 IRQ Mapping Table

| IRQ | Description | IRQ | Description |
|---|---|---|---|
| IRQ0 | System Timer | IRQ8 | RTC clock |
| IRQ1 | Keyboard | IRQ9 | ACPI |
| IRQ2 | Available | IRQ10 | COM 4 |
| IRQ3 | COM2 | IRQ11 | COM 3 / COM 5 |
| IRQ4 | COM1 | IRQ12 | PS/2 mouse |
| IRQ5 | SMBus Controller | IRQ13 | FPU |
| IRQ6 | FDC | IRQ14 | Primary IDE |
| IRQ7 | Parallel port | IRQ15 | Secondary IDE |

**Table C-3: IRQ Mapping Table**

## C.4 DMA Channel Assignments

| Channel | Function |
|---|---|
| 0 | Available |
| 1 | Available |
| 2 | Floppy disk (8-bit transfer) |
| 3 | Available |
| 4 | Cascade for DMA controller 1 |
| 5 | Available |
| 6 | Available |
| 7 | Available |

**Table C-4: DMA Channel Assignments**

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Appendix

D

# External AC'97 Audio CODEC

# D.1 Introduction

The motherboard comes with an on-board Realtek ALC655 CODEC. Realtek ALC655 is a 16-bit, full duplex AC'97 Rev. 2.3 compatible audio CODECwith a sampling rate of 48KHz.

## D.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through three phone jacks on the rear panel of the motherboard. The phone jacks include:

1. A LINE input shared with surround output
2. A MIC input shared with Center and LFE output
3. A LINE output
4. A MIC input line.

## D.1.2 Driver Installation

The driver installation has been described in **Chapter 6**, **Section 6.5.**

After rebooting the sound effect configuration utility appears in the Windows Control Panel (see **Figure D-1**). If the peripheral speakers are properly connected, sound effects should be heard.

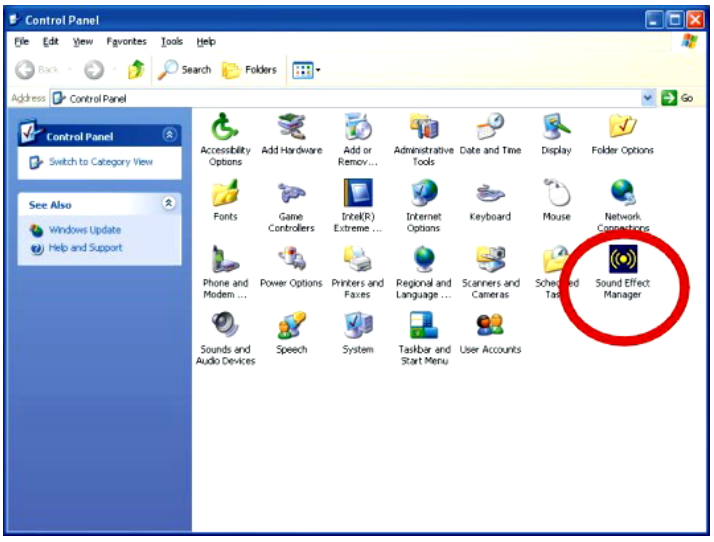


**Figure D-1: Sound Effect Manager Icon**

# D.2 Sound Effect Configuration

## D.2.1 Accessing the Sound Effects Manager

To access the **Sound Effects Manager**, please do the following:

**Step 1:** Install the audio CODEC driver.

**Step 2:** Click either:

- The Sound Effect Manager icon in the Notification Area of the system task bar (see **Figure D-2**), or
- The Sound Effect Manager icon in the Control Panel (see **Figure D-3**).

**Figure D-2: Sound Effect Manager Icon [Task Bar]**

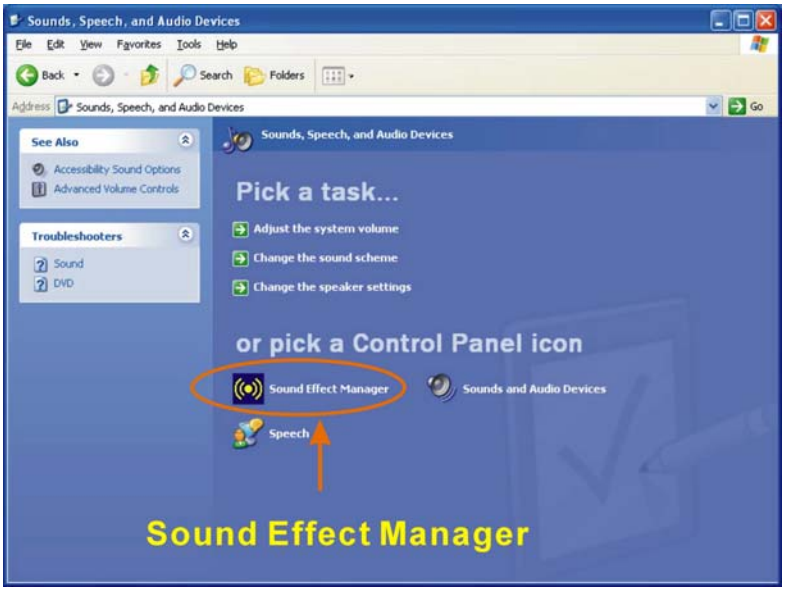


**Figure D-3: Sound Effect Manager Icon [Control Panel]**

**Step 3:** The sound effect manager appears. (See **Figure D-4**)

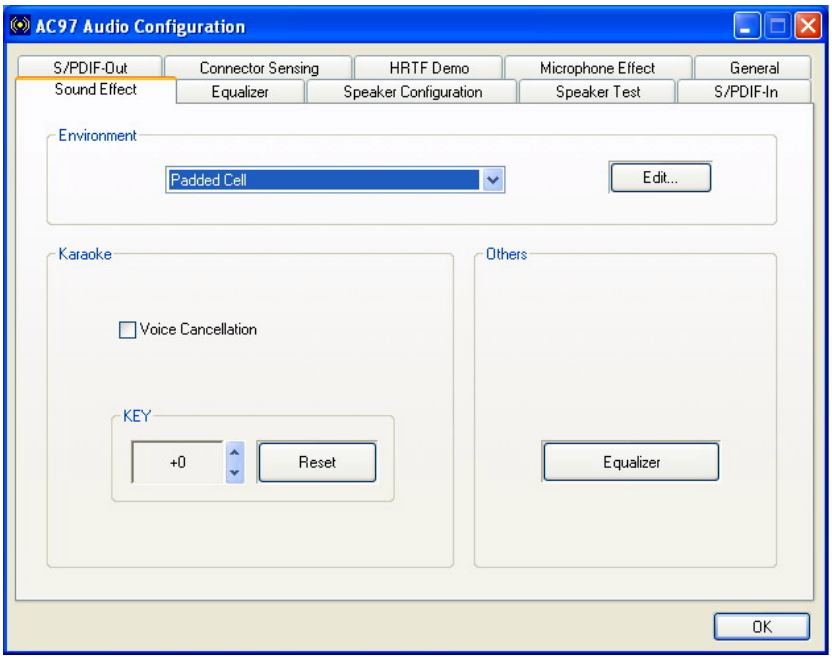


**Figure D-4: Sound Effects Manager (ALC655)**

**NOTE:**

The Sound Effect Manager shown in **Figure D-4** is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

### D.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** in **Figure D-4**.

**NOTE:**

The **Karaoke Mode** is configured in the **Sound Effect** menu. To access Karaoke configuration settings, click on the **Sound Effect** menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

**NOTE:**

Not all RealTek **Sound Effect Managers** have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect***:- Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit the sound effect click "**EDIT**."
- ***Karaoke Mode***:- The **Karaoke Mode** is accessed in the Sound Effect window. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enables users to define a key

that fits a certain vocal range.

- ***Equalizer Selection***:- Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.

- ***Speaker Configuration***:- Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings

- ***Speaker Test*:-** Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.

- ***S/PDIF-In & S/PDIF-Out***:- These functions are currently not supported.

- ***Connector Sensing***:- Realtek ALC655 detects if an audio device is plugged into the wrong connector. If an incorrect device is plugged in a warning message appears.

- ***HRTF Demo***:- Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.

- ***Microphone Effect***:- Microphone noise suppression is enabled in this menu.

- ***General***:- General information about the installed AC'97 audio configuration utility is listed here.

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